

US EPA ARCHIVE DOCUMENT

REGULATION AND POLICY CONCERNING MINE PLACEMENT OF COAL COMBUSTION WASTE IN 26 STATES

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REGULATION AND POLICY CONCERNING MINE PLACEMENT OF COAL COMBUSTION WASTE IN 26 STATES

This report reviews and summarizes current State regulations and policy concerning the placement of coal combustion wastes (CCWs) in surface and underground mines in 26 States. Mine placement of CCW occurs most commonly in coal mines. Therefore, the States reviewed for this report were selected based on the number of coal mines.¹ Mine placement typically is conducted for two purposes:

- To dispose of the CCW as an alternative to disposal in a landfill or surface impoundment, and
- To achieve or assist in the reclamation of the mine, whether as part of ongoing operations or following the completion of mining (including abandoned mines).

Given these dual purposes, States may regulate the activity under mining and mine reclamation regulations, solid waste disposal regulations, or a combination of both. Therefore, this review examines both mining and solid waste regulatory programs and policy in the 26 States. The review focuses on the following elements of State programs:

- Identification of the State agency(ies) with authority for overseeing the practice,
- The placement uses allowed or authorized,
- Whether the State makes a regulatory distinction between beneficial use and disposal at mine sites,
- Pre-placement site characterization requirements,
- Siting restrictions,
- Reclamation or placement plan requirements,
- Waste characterization requirements (both before and during placement),
- Waste characteristic limits,
- Whether (and how) operators are required to address acid-base balance issues,
- Whether regulatory approval is required for a project to proceed,
- Public participation requirements,
- Ground-water monitoring requirements (both during and after placement),
- Performance standards,

¹ In addition, Michigan was included because placement in non-coal mines was known to be occurring in that State.

- Enforceable limits and corrective action provisions,
- Operational or placement engineering requirements,
- Performance bonding or financial assurance requirements, and
- Other closure and post-closure requirements.

Where State mining regulations are applied to CCW placement, these regulations frequently are promulgated under the authority of the Federal Surface Mining Control and Reclamation Act of 1977 (SMCRA). In fact, many States' mining regulations are substantively similar or identical to Federal SMCRA regulations. As a result, an understanding of the Federal SMCRA regulations and their applicability to CCW placement is critical to this review of State programs. To assist with this understanding, Table 1 summarizes SMCRA regulations and guidance from the implementing agency, the U.S. Department of Interior Office of Surface Mine Reclamation and Enforcement (OSM), applicable to CCW placement with regard to the review elements.

Because the Federal SMCRA regulations apply only to coal mines, many State programs similarly address CCW placement only in coal mines. As a result, this review focuses primarily on regulations applicable to coal mine placement. In cases where States have regulatory programs applicable to non-coal mine placement and information on these programs was available, non-coal mine placement programs are discussed in the individual State summaries.

This review was conducted primarily using the ENFLEX Federal and State Regulations and Federal and State Statutes databases. These databases contain the full text of the environment, health, safety, and hazardous materials transportation regulations and statutes for the Federal Government, all 50 States, the District of Columbia, and Puerto Rico. The databases are updated monthly. The review also utilized previous research and information obtained in support of EPA's Regulatory Determination on Wastes from the Combustion of Fossil Fuels (65 FR 32214, May 22, 2000). Where clarification of the regulatory language was necessary, appropriate State regulatory authorities were contacted. Citations to the specific regulatory sections reviewed and identification of any contacts made are included with each State summary.

Table 2 summarizes the structure of the State regulations pertaining to mine placement of CCW. Table 3 identifies the key components of the State programs that differ from (e.g., are more stringent or specific to CCW) than Federal SMCRA requirements. The pages following the tables describe each State's applicable policy and regulatory requirements in greater detail.

Table 1. Federal SMCRA Regulations/Guidance Applicable to the Mine Placement of Coal Combustion Wastes

Applicability	<ul style="list-style-type: none"> • Placement for reclamation of surface coal mines. • Placement for stabilization of underground mines. • Discharge into underground mines (fly ash and flue gas desulfurization sludge only). • Disposal at coal mine sites (under regulatory provisions for disposal of non-coal mine waste).
<i>Before Placement</i>	
Distinction Between Beneficial Use and Disposal	None specified
Site Characterization	<p>The reclamation plan (see below) must include:</p> <ul style="list-style-type: none"> • Geologic and hydrologic information. • Land use information. • Information on siltation, structures, impoundments, banks, dams, and diversions. • Protection of public parks and historic places. • Relocation or use of public roads. • Disposal of excess spoil. • Road systems. <p>In addition, a probable hydrologic consequences (PHC) determination is required. <i>Under OSM guidance, the PHC should specifically address coal combustion waste placement.</i> The PHC must:</p> <ul style="list-style-type: none"> • Determine the consequences of the proposed mining and reclamation operation upon the quality and quantity of surface and groundwater. • Consider seasonal flow conditions for the proposed permit area and adjacent areas. • Be based on baseline hydrologic, geologic, and other information collected for the permit application • Must include findings on whether any adverse impacts may occur.
Siting Restrictions	<p>Non-coal mine waste may not be disposed in a refuse pile or impounding structure. Non-coal mine waste disposal sites may not be located within 8 feet of any coal outcrop or coal storage area.</p> <p>In addition, unless the operator qualifies for an exemption, surface coal mining operations in general may not be conducted:</p> <ul style="list-style-type: none"> • On any lands within the boundaries of the National Park System, the National Wildlife Refuge System, the National System of Trails, the National Wilderness Preservation System, the Wild and Scenic Rivers System, or National Recreation Areas. • On any Federal lands within a national forest. • On any lands where the operations would adversely affect parks or any place in the National Register of Historic Places. • Within 100 feet of any public road or cemetery. • Within 300 feet of occupied dwellings, parks, or public buildings.

Table 1. Federal SMCRA Regulations/Guidance Applicable to the Mine Placement of Coal Combustion Wastes

Reclamation Plan	<p>A reclamation plan that provides for protection of the environment, public safety, and, ideally, a new beneficial land use is required. <i>Under OSM guidance, the reclamation plan should address coal combustion waste placement.</i> The reclamation plan must include, at a minimum a:</p> <ul style="list-style-type: none"> • Detailed timetable. • Detailed estimate of the cost. • Plan for backfilling, soil stabilization, compacting, and grading. • Plan for removal, storage, and redistribution of topsoil, subsoil, and other material. • Plan for revegetation. • Description of the measures to be used to maximize the use and conservation of the coal resource. • Description of measures to be employed to ensure that all debris, acid-forming and toxic-forming materials, and materials constituting a fire hazard are disposed of in accordance with 30 CFR 816.89 and 816.102. • Description, including appropriate cross sections and maps, of the measures to be used to seal or manage mine openings, and to plug, case, or manage exploration holes, other bore holes, wells, and other openings within the proposed permit area, in accordance with 30 CFR 816.13 through 816.15. • Description of steps to be taken to comply with the requirements of the Clean Air Act, the Clean Water Act, and other applicable air and water quality laws and regulations and health and safety standards. <p>A hydrologic reclamation plan that is specific to the local hydrologic conditions also is required. The plan must contain the steps to be taken during the mining and reclamation through bond release to:</p> <ul style="list-style-type: none"> • Minimize disturbances to the hydrologic balance within the permit and adjacent areas; to prevent material damage outside the permit area. • Meet the applicable Federal and State water quality laws and regulations. • Protect the rights of present water users. • Avoid acid or toxic drainage. • Prevent, to the extent possible using the best technology currently available, additional contributions of suspended solids to stream flow. • Provide water-treatment facilities when needed. • Control drainage. • Restore approximate pre-mining recharge capacity and protect or replace rights of present water users. <p><i>Under OSM guidance, the hydrologic reclamation plan and PHC determination (see above) should address coal combustion waste placement, including:</i></p> <ul style="list-style-type: none"> • <i>The probability of adverse impacts on the hydrologic balance.</i> • <i>Contamination of surface or ground-water supplies.</i>
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Table 1. Federal SMCRA Regulations/Guidance Applicable to the Mine Placement of Coal Combustion Wastes

	<ul style="list-style-type: none"> • <i>The time for manifestation of impacts to surface or ground-water supplies.</i>
Waste Characterization	Not required. The operator, however, must ensure that leachate and drainage from non-coal mine waste disposal areas does not degrade surface or groundwater, which may necessitate performing waste characterization.
Waste Characteristic Limits	None specified
Address Acid-Base Balance/Acid Mine Drainage	Operators must handle earth materials, ground-water discharges, and runoff in a manner that minimizes the formation of acid or toxic drainage. No specific methodology for addressing this is prescribed.
Regulatory Approval Required to Proceed	A permit, issued by the SMCRA permitting authority, covering all coal mining operation and reclamation activities is required. <i>Under OSM guidance, the permit application should include identification of coal combustion waste placement areas.</i> Final disposal of non-coal mine waste shall be in a designated disposal site in the permit area or a State-approved solid waste disposal area.
Public Participation	SMCRA provides citizens with the right to petition the OSM to initiate a proceeding for the issuance, amendment, or repeal of any regulation under SMCRA. SMCRA also has public participation provisions for an application for a permit, a major revision of a permit, or a renewal of a permit. These provisions require public notice by the operator, allow the submission of public comments within 30 days of notice, and require public accessibility to the application, comments, and the final written decision of the permitting authority (the permitting authority must also notice their decision to the applicant, commenters, and local government officials). <i>Under OSM guidance, any permit revision application proposing coal combustion waste placement is a major permit revision subject to these requirements.</i>
<i>During Placement</i>	
Ongoing Waste Characterization	Not required. The operator, however, must ensure that leachate and drainage from non-coal mine waste disposal areas does not degrade surface or groundwater, which may necessitate performing waste characterization.
Ground-water Monitoring	<p>A ground-water monitoring plan based upon the PHC determination is required. The plan shall provide for:</p> <ul style="list-style-type: none"> • Monitoring of parameters that relate to the suitability of the groundwater for current and approved post-mining land uses and to the objectives for protection of hydrologic balance (see below under performance standards). • At a minimum, monitoring for TDS or specific conductance, pH, total iron, total manganese, and water levels. • Submission of data every 3 months.

Table 1. Federal SMCRA Regulations/Guidance Applicable to the Mine Placement of Coal Combustion Wastes

	The regulatory authority may require additional monitoring.
Performance Standards	<p>For disposal of non-coal mine waste, placement and storage shall ensure that leachate and surface runoff do not degrade surface or groundwater.</p> <p>All surface mining and reclamation activities shall be conducted to:</p> <ul style="list-style-type: none"> • Minimize disturbance to the hydrologic balance within the permit and adjacent areas. • Prevent material damage to the hydrologic balance outside the permit area. • Ensure protection or replacement of water rights. • Support approved post-mining land uses. <p><i>Under OSM guidance, these performance standards should be specifically applied to coal combustion waste placement.</i></p>
Enforceable Limits	<p>Compliance with all applicable Federal and State water quality requirements, Federal and State air quality requirements, and Endangered Species Act provisions is required.</p> <p>Operation of non-coal mine waste disposal sites shall be conducted in compliance with all local, State, and Federal requirements.</p>
Corrective Action	<p>Each permit shall be subject to the following condition: the permittee shall take all possible steps to minimize any adverse impact to the environment or public health and safety resulting from noncompliance with any term or condition of the permit including, but not limited to:</p> <ul style="list-style-type: none"> • Any accelerated or additional monitoring necessary to determine the nature and extent of noncompliance and the results of the noncompliance. • Immediate implementation of measures necessary to comply. • Warning, as soon as possible after learning of such noncompliance, any person whose health and safety is in imminent danger due to the noncompliance.
Operational Requirements/ Placement Engineering	<p>For non-coal mine waste disposal areas, wastes shall be routinely compacted and covered to prevent wind-borne waste.</p> <p>Surface mining operators must develop an operation plan, air pollution control plan, and fish and wildlife protection and enhancement plan. The operation plan must include a description of the operation of facilities, such as impoundments, overburden and topsoil storage areas, and non-coal waste disposal areas. <i>Under OSM guidance, the operation plan should address coal combustion waste placement. Also under OSM guidance,</i></p>

Table 1. Federal SMCRA Regulations/Guidance Applicable to the Mine Placement of Coal Combustion Wastes

	<p><i>the air pollution control plan should specifically address coal combustion waste placement operations, including fugitive dust control during transport and placement within the permit area.</i></p> <p>Disturbed areas shall be backfilled and graded to:</p> <ul style="list-style-type: none"> • Achieve the approximate original contour. • Eliminate all high walls, spoil piles, and depressions. • Achieve an appropriate post-mining slope. • Minimize erosion and water pollution. • Support the approved post-mining land use. <p><i>Under OSM guidance, coal combustion waste placement should comply with the backfill, grading, and approximate original contour requirements.</i></p> <p><i>Also under OSM guidance:</i></p> <ul style="list-style-type: none"> • <i>Coal combustion waste should not be disposed in mined-out areas if spoil would be displaced and disposed as excess spoil.</i> • <i>The timing of coal combustion waste placement operations should be based on completion of mining and reclamation operations in accordance with contemporaneous reclamation performance standards.</i>
Closure/Post Closure Care	
Ongoing Ground-water Monitoring	Ground-water monitoring as described above must proceed through the mining period and continue during reclamation until bond release.
Performance Bonding or Financial Assurance	<p>A performance bond is required.</p> <ul style="list-style-type: none"> • The bond(s) must cover the entire permit area. • The operator must file additional bonds to cover succeeding increments. • The operator must file both cumulative and incremental bond schedules. • The period of liability shall be for the duration of the operation and for a period until successful revegetation or achievement of the reclamation requirements. • Release of the performance bonds are contingent upon the successful completion of the reclamation plan (including revegetation).
Other Closure/Post-closure Requirements	<p>Final disposal of non-coal mine wastes requires:</p> <ul style="list-style-type: none"> • A minimum of 2 feet of soil cover. • Slope stabilization.

Table 1. Federal SMCRA Regulations/Guidance Applicable to the Mine Placement of Coal Combustion Wastes

- | | |
|--|---|
| | <ul style="list-style-type: none">• Revegetation. |
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Table 2. Summary of Structure of State Regulatory Programs for Mine Placement of CCW

State	Current Coal Mine Placement?	Beneficial Use/ Disposal Distinction?	Applicable Regulations		Public Participation?	Non-coal Placement Regulations? [1]
			Mining	Solid Waste		
AL	Yes	No	T	T	Yes	
AK	Yes	No	T	T	Yes	
AZ	Yes	No	T (federal)	T	Yes	
CO	Yes	No	T	T	Yes	Yes
IL	Yes	Yes, based on volume	T	T	Yes	
IN	Yes	No	T		Yes	
KY	Yes	Yes, based on purpose	T	T	Yes	
MD	Yes	No	T	T	No	Yes
MO	Yes	Yes, based on purpose & ecological risk	T	T	Yes	Yes
MT	Yes	No	T		CBC	
NM	Yes	No	T		No	
ND	Yes	No	T	T	Yes	
OH	Yes	Yes, based on volume	T	T	Yes	
PA	Yes	Yes, based on environmental benefit	T	T	Yes	Yes
TX	Yes	Yes, based on purpose	T	T	Yes	
WA	Yes	No	T (federal)	T	Yes	
WV	Yes	Yes, based on volume	T	T	Yes	

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			Mining	Solid Waste		
WY	Yes	No	T	T	Yes	
Placement in Coal Mines Not Currently Occurring [2]						
AR	No	No	T	T	Yes	
KS	No (limestone mine only)	No	T	T	Yes	Yes
LA	No	No	T	T	[3]	
MI	No (limestone mine only)	No	T _(federal)	T	No	Yes
OK	No (non-coal mines only)	No	T		[3]	
TN	No	No	T _(federal)	T	[3]	
UT	No	No	T		[3]	
VA	No	Yes, based on purpose	T		Yes	

Key:

T Applicable
 CBC Case-by-case requirement

Footnotes:

[1] This column identifies States where non-coal mine placement regulations are in place and information on these programs was available.

[2] Coal mine placement has yet to occur in these States, so the information presented here is based on the requirements that would likely apply were placement to occur.

[3] Coal mine placement has yet to occur in this State, therefore, applicable public participation requirements have yet to be determined.

Table 3. Summary of State Requirements for Mine Placement of CCW That Are in Addition to Federal SMCRA Requirements

State	Site Characterization/ Reclamation Plan	Siting Restrictions	Waste Characterization (before & during placement)	Waste Characterization Limits	Acid Mine Drainage	Ground-water Monitoring (during & after placement)	Enforce-able Limits	Operational Requirements			Financial Assurance/ Bonding	Other Closure
								Ground-water Table Restrictions	Volume Restrictions	Other Operational		
AL			T _(before)	T								
AK		T				T _(both)					T	
AZ			T _(before)			CBC (both)	T			CBC	T	T
CO	T	T	T _(both)			T _(both)	T	T	T	T	CBC	
IL	D	T	T _(both)		T	T _(during) CBC _(after)	T		T	T		
	BU		T _(before)	T						T		
IN	T	T	T _(both)	T		T _(during)			T	T		T
KY	T	T	T _(both)	T		T _(both)	T	T	T	T	T	T
MD	T		T _(before)	T								
MO	T		T _(before)	T		T _(during) CBC _(after)		T		T		
MT	T		T _(before)	T		T _(both)				T		
NM	T		T _(before)	T		T _(during) CBC _(after)				T		T
ND	T	T	T _(before)			T _(both)				T	T	T
OH	D	CBC	T _(both)	T		CBC (both)	T			T		T
	BU	T	T _(both)	T	T	T _(during)		T	T	T		
PA [1]	T	T	T _(both)	T	T	T _(both)	T	T	T	T		
TX	D	T	T _(before)			CBC (both)		T		T	T	T

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								Ground-water Table Restrictions	Volume Restrictions	Other Operational		
BU	T											
WA		T				T (during)				T		
WV	T		T (both)		T		CBC			T		
WY			T (before)							T		
Placement in Coal Mines Not Currently Occurring [2]												
AR			T (before)	T		CBC (during)				T		
KS	T	CBC				CBC (during)				T	CBC	CBC
LA	In Louisiana, there is currently no placement of CCW in mines and applicable requirements have yet to be determined by State regulators.											
MI	T	T	T (before)	T							T	T
OK	In Oklahoma, there is currently no placement of CCW in coal mines and applicable requirements have yet to be determined by State regulators.											
TN		T				CBC (both)		T		T	CBC	T
UT	In Utah, there is currently no placement of CCW in mines and applicable requirements have yet to be determined by State regulators.											
VA	T	T	T (before)				CBC			T		

Key:

T Required
 CBC Case-by-case requirement
 D Disposal requirements
 BU Beneficial use requirements

Footnotes:

- [1] The requirements vary slightly depending on whether use is regulated as CCW placement, alkaline addition, low permeability, or soil additive.
 [2] Coal mine placement has yet to occur in these States, so the information presented here is based on the requirements that would likely apply were placement to occur.

ALABAMA

In Alabama, the placement of CCW in mines is subject to applicable State mining regulations, which are substantively identical to the Federal SMCRA regulations. In addition, the Alabama Surface Mining Commission (SMC) has internal policy that specifically addresses CCW placement. This policy, among other things, requires that disposal of CCW in mine pits requires a permit from the Alabama Department of Environmental Management's Solid Waste Division (SWD). Alabama's solid waste program regulations (see *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*, December 14, 2000), however, specifically EXCLUDE wastes which result from the combustion of coal at electric generating plants from the definition of industrial solid waste. On a case-by-case basis, fly ash and bottom ash may be considered special wastes under the solid waste regulations. Solid waste permit requirements for special wastes are determined on a case-by-case basis.

References

Alabama Regulations: §§ 335-13-1-.03(12), (63), and (134)

AAC Chapter 880-X

Randall Johnson, Director, Surface Mining Commission (personal communication, 4/26/01)

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ALABAMA	
Regulatory Agency Oversight	<ul style="list-style-type: none"> Alabama Surface Mining Commission (SMC) Alabama Department of Environmental Management, Solid Waste Division (SWD)
Allowed Uses	<ul style="list-style-type: none"> Disposal in mine pits. Placement on the surface of reclaimed sites.
<i>Before Placement</i>	
Distinction Between Beneficial Use and Disposal	None specified.
Site Characterization	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Siting Restrictions	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Reclamation Plan	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Waste Characterization	The SMC allows disposal of CCW on the surface of reclamation areas if tests are conducted demonstrating that it is suitable as a soil amendment and it does not contain toxic or hazardous materials which will contaminate ground or surface water. The internal policy does not prescribe specific procedures for this testing.
Waste Characteristic Limits	
Address Acid-Base Balance/Acid Mine Drainage	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
State Approval Required to Proceed	SMC requires a major modification to the mining permit for CCW placement in mine pits (while use as a soil amendment would be a minor amendment). In addition, disposal in mine pits requires a solid waste disposal permit from SWD.
Public Participation	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

ALABAMA	
<i>During Placement</i>	
Ongoing Waste Characterization	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Ground-water Monitoring	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Performance Standards	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Enforceable Limits	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Corrective Action	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Operational Requirements/ Placement Engineering	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
<i>Closure/Post Closure Care</i>	
Ongoing Ground-water Monitoring	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Performance Bonding or Financial Assurance	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Other Closure/Post-closure Requirements	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

ALASKA

In Alaska, the placement of CCW in mines is subject to applicable State mining regulations, which are substantively identical to the Federal SMCRA regulations. In addition, under the solid waste program, CCW is regulated as inert waste and, when placed in mines, is subject to applicable solid waste regulations. These regulations require a permit and include the following:

- Siting restrictions,
- State approval process,
- Ground-water monitoring (during and after placement) on a case-by-case basis,
- Corrective action, and
- Financial assurance.

Currently, all coal ash in Alaska comes from a single source – the Usibelli Coal Mine in Healy. They minefill the ash generated from their own operations.

References

Alaska Regulations: 18 AAC 60.990(64); 18 AAC 60.460; 11 AAC Chapter 90

Bruce Buzby, Division of Mining, Land, and Water, Alaska Department of Environmental Conservation (personal communication, 4/23/01)

Heather Stockard and Nancy Sonafrank, Solid Waste Management, Division of Environmental Health, Alaska Department of Environmental Conservation (personal communication, 4/20/01)

ALASKA	
Regulatory Agency Oversight	Alaska Department of Environment Conservation: <ul style="list-style-type: none"> • Division of Mining, Land, and Water • Division of Environmental Health, Solid Waste Management (SWM)
Allowed Uses	Mine placement.
<i>Before Placement</i>	
Distinction Between Beneficial Use and Disposal	None specified.
Site Characterization	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Siting Restrictions	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • Not on slopes greater than 10% grade or on unstable soils. • Floodplain restrictions. • Not within 10 feet of highest measured level of an aquifer.
Reclamation Plan	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Waste Characterization	Not required (<i>as per federal SMCRA</i>).
Waste Characteristic Limits	None specified (<i>as per federal SMCRA</i>).
Address Acid-Base Balance/Acid Mine Drainage	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
State Approval Required to Proceed	<i>Substantively similar to federal SMCRA, plus:</i> A standard inert waste disposal permit is required.
Public Participation	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

ALASKA	
<i>During Placement</i>	
Ongoing Waste Characterization	Not required (<i>as per federal SMCRA</i>).
Ground-water Monitoring	<p><i>Substantively similar to federal SMCRA, plus:</i> Monitoring specific to CCW placement is required if SWM:</p> <ul style="list-style-type: none"> • Determines that non-inert waste is or has been present at the site. • Detects evidence of a spill or ground-water contamination. • Finds unexplained contamination in nearby wells. <p>If such monitoring is needed:</p> <ul style="list-style-type: none"> • Must establish background water quality. • Detection monitoring required—must determine whether there is a statistically significant increase over background values. If so, assessment monitoring must be performed.
Performance Standards	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Enforceable Limits	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Corrective Action	<p><i>Substantively similar to federal SMCRA, plus:</i> Corrective measures must be performed if detection monitoring determines there is a statistically significant increase over background (see above).</p>
Operational Requirements/ Placement Engineering	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

ALASKA	
Closure/Post Closure Care	
Ongoing Ground-water Monitoring	<i>Substantively similar to federal SMCRA, plus:</i> If additional ground-water monitoring is required by SWM for the disposal period, it must continue through the post-closure care period.
Performance Bonding or Financial Assurance	<i>Substantively similar to federal SMCRA, plus:</i> SWM requires proof of financial responsibility for disposal area to cover closure and post-closure care using self-insurance, insurance, surety, or other guarantee approved by SWM.
Other Closure/Post-closure Requirements	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

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ARIZONA

In Arizona, the placement of CCW in mines is subject to applicable Federal mining regulations – the mining program is administered by the US Department of the Interior’s Office of Surface Mine Reclamation and Enforcement (OSM) rather than the State. Under the State's solid waste program, if CCW is classified as inert material by the Arizona Department of Environmental Quality (ADEQ), it is exempt from State solid waste permitting regulations. Inert material is defined as material that: 1) is not flammable, 2) will not decompose, 3) will not leach substances in concentrations that exceed applicable aquifer water quality standards when subjected to a water leach test that is designed to approximate natural infiltrating waters. If CCW is not classified as inert, the disposal of it would require the mine operator to provide ADEQ with a notice, operate in accordance with 40 CFR 257, and obtain an Aquifer Protection Permit (APP) (see *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*, December 14, 2000). Specifically, the requirements address:

- Waste characterization,
- State approval process,
- Ground-water monitoring (during and after placement) on a case-by-case basis,
- Enforceable limits,
- Corrective action,
- Operational requirements/placement engineering,
- Financial assurance, and
- Closure

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References

Arizona Statutes: ARS §§ 49-241, 49-701(15), 49-701.01(B)(17), 49-762.07(A), and 49-762.07(E)

Barry Abbott, Arizona Department of Environmental Quality, Waste Programs Division (personal communication, 5/4/01)

ARIZONA	
Regulatory Agency Oversight	<ul style="list-style-type: none"> • US Department of the Interior OSM • Arizona Department of Environmental Quality, Waste Programs Division
Allowed Uses	Mine placement.
<i>Before Placement</i>	
Distinction Between Beneficial Use and Disposal	None specified.
Site Characterization	<i>Regulated by OSM under federal SMCRA, no additional requirements.</i>
Siting Restrictions	<i>Regulated by OSM under federal SMCRA, no additional requirements.</i>
Reclamation Plan	<i>Regulated by OSM under federal SMCRA, no additional requirements.</i>
Waste Characterization	Characterization using a water leach test that is designed to approximate natural infiltrating waters is required to determine if the waste is subject to ADEQ permitting requirements.
Waste Characteristic Limits	None specified (<i>as per federal SMCRA</i>).
Address Acid-Base Balance/Acid Mine Drainage	<i>Regulated by OSM under federal SMCRA, no additional requirements.</i>
State Approval Required to Proceed	<i>Regulated by OSM under federal SMCRA, plus:</i> If the CCW does not meet the definition of inert, an Aquifer Protection Permit from ADEQ would be required, and additional operating requirements would apply.
Public Participation	<i>Regulated by OSM under federal SMCRA, no additional requirements.</i>

ARIZONA	
<i>During Placement</i>	
Ongoing Waste Characterization	Not required (<i>as per federal SMCRA</i>).
Ground-water Monitoring	<i>Regulated by OSM under federal SMCRA, plus:</i> If the CCW does not meet the definition of inert, additional ground-water monitoring may be required under the Aquifer Protection Permit.
Performance Standards	<i>Regulated by OSM under federal SMCRA, no additional requirements.</i>
Enforceable Limits	<i>Regulated by OSM under federal SMCRA, plus:</i> If the CCW does not meet the definition of inert, the Aquifer Protection Permit would establish a compliance boundary and alert levels that may trigger corrective action.
Corrective Action	<i>Regulated by OSM under federal SMCRA, plus:</i> If the CCW does not meet the definition of inert, Aquifer Protection Permit corrective action provisions would apply.
Operational Requirements/ Placement Engineering	<i>Regulated by OSM under federal SMCRA, plus:</i> If the CCW does not meet the definition of inert, additional operating requirements may be established under the Aquifer Protection Permit.
<i>Closure/Post Closure Care</i>	
Ongoing Ground-water Monitoring	<i>Regulated by OSM under federal SMCRA, plus:</i> If the CCW does not meet the definition of inert, additional ground-water monitoring may be required under the Aquifer Protection Permit.
Performance Bonding or Financial Assurance	<i>Regulated by OSM under federal SMCRA, plus:</i> If the CCW does not meet the definition of inert, Aquifer Protection Permit financial assurance requirements would apply.
Other Closure/Post-closure Requirements	<i>Regulated by OSM under federal SMCRA, plus:</i> If the CCW does not meet the definition of inert, closure and post-closure plans would be required under the Aquifer Protection Permit, with additional closure requirements determined on a case-by-case basis.

ARKANSAS

In Arkansas, there is currently no placement of CCW in active mines. If placement were to occur, it would be subject to applicable State mining regulations, which are substantively similar to the Federal SMCRA regulations. In addition, since CCW is defined as industrial solid waste, a solid waste disposal permit would be required for mine placement, with review and approval from the Mining Division. According to Jerry Delavan of the Arkansas Department of Environmental Quality, internal policy would apply additional requirements to mine placement projects in the following areas:

- Waste characterization (pre-placement and during placement),
- Waste characteristic limits,
- State approval process,
- Ground-water monitoring, and
- Operational requirements/placement engineering.

References

Arkansas Statutes: ACA 15-58-101 to 15-58-510

Arkansas Regulations: APC & EC Solid Waste Regulation No. 22 §102; APC & EC Surface Coal Mining and Reclamation Code No. 20

Jerry Delavan, Arkansas Department of Environmental Quality, Solid Waste Management Division (personal communication, 4/24/01)

ARKANSAS	
Regulatory Agency Oversight	Arkansas Department of Environmental Quality: <ul style="list-style-type: none"> • Mining Division • Solid Waste Management Division
Allowed Uses	Mine placement.
<i>Before Placement</i>	
Distinction Between Beneficial Use and Disposal	None specified.
Site Characterization	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Siting Restrictions	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Reclamation Plan	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Waste Characterization	Under the solid waste program's internal policy, the CCW would need to pass a TCLP test prior to placement.
Waste Characteristic Limits	
Address Acid-Base Balance/Acid Mine Drainage	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
State Approval Required to Proceed	<i>Substantively similar to federal SMCRA, plus:</i> A solid waste permit would be required, with review and approval by the Mining Division.
Public Participation	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

ARKANSAS	
<i>During Placement</i>	
Ongoing Waste Characterization	Under the solid waste program's internal policy, the CCW would need to pass a TCLP test during active disposal.
Ground-water Monitoring	<i>Substantively similar to federal SMCRA, plus:</i> Under the solid waste program's internal policy, additional monitoring might be required.
Performance Standards	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Enforceable Limits	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Corrective Action	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Operational Requirements/ Placement Engineering	<i>Substantively similar to federal SMCRA, plus:</i> Under the solid waste program's internal policy, the site would need to meet an in-situ hydraulic conductivity standard of 1.0×10^{-5} .
<i>Closure/Post Closure Care</i>	
Ongoing Ground-water Monitoring	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Performance Bonding or Financial Assurance	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Other Closure/Post-closure Requirements	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

COLORADO

In Colorado, the Colorado Department of Natural Resources, Division of Minerals and Geology (CDMG) has dual jurisdiction with the Colorado Department of Public Health and the Environment, Solid Waste Division (CDPHE) for the disposal of CCW in mines. The activity is subject to applicable State mining regulations, which are substantively similar to the Federal SMCRA regulations. Specific requirements are determined on a site-by-site basis. CDMG, however, generally considers requirements in the following areas:

- Site characterization,
- Siting restrictions,
- Waste characterization (pre-placement and during placement),
- State approval process,
- Public participation,
- Ground-water monitoring,
- Enforceable limits,
- Operational requirements/placement engineering, and
- Financial assurance.

In addition, CCW is defined as industrial solid waste and its disposal in a mine requires a solid waste permit – issued by the local governmental entity under the authority of the CDPHE – called the Certification of Designation (see *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*, December 14, 2000). The issuance of the Certificate of Designation involves coordination between CDMG, CDPHE, and the local government authority. The solid waste program could apply additional requirements to CCW placement projects under the Certificate of Designation, but has thus far deferred to CDMG's requirements.

Colorado also has a mining regulatory program applicable to non-coal mines that is similar to the SMCRA-based program for coal mines. Requirements for CCW placement under this program are implemented similarly to those described above for coal mines. The State has denied two permits for CCW placement in gravel pits and recently approved one project for placement in a gravel pit.

References

Colorado Statutes: CRS 34-33-101

Colorado Regulations: 2 CCR 407-2; 6 CCR 1007-2-1.2

David Berry, Coal Program, Colorado Division of Minerals and Geology, Colorado Department of Natural Resources (personal communication, 4/26/01)

Glenn Mallory, Solid Waste Division, Colorado Department of Public Health and the Environment (personal communication, 5/21/01)

Mike Long, Division of Minerals and Geology, Colorado Department of Natural Resources. Presentation at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

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COLORADO	
Regulatory Agency Oversight	<ul style="list-style-type: none"> • Colorado Department of Natural Resources, Division of Minerals and Geology (CDMG) • Colorado Department of Public Health and the Environment, Solid Waste Division (CDPHE) • Local governmental entities
Allowed Uses	Mine placement.
<i>Before Placement</i>	
Distinction Between Beneficial Use and Disposal	None specified.
Site Characterization	<i>Substantively similar to federal SMCRA, plus:</i> Requirements specific to CCW placement determined on a site-by-site basis. The two active CCW placement projects required a minimum of 12 months of background monitoring, plus geologic background data.
Siting Restrictions	<i>Substantively similar to federal SMCRA, plus:</i> Requirements specific to CCW placement determined on a site-by-site basis. The two active CCW placement projects required no disposal in the flood plain.
Reclamation Plan	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Waste Characterization	A detailed materials analysis is required. TCLP testing was required at one of the two active CCW placement projects.
Waste Characteristic Limits	None specified (<i>as per federal SMCRA</i>).
Address Acid-Base Balance/Acid Mine Drainage	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
State Approval Required to Proceed	<i>Substantively similar to federal SMCRA, plus:</i> In addition to permitting under the Colorado Surface Mining Reclamation Act, a Certificate of Designation is required. The process involves coordination between CDMG, CDPHE, and the local government authority responsible for issuing the Certificate of Designation for disposal.
Public Participation	Public notice and involvement are required under the Certificate of Designation and SMCRA programs. Citizen suits are allowed.

COLORADO	
<i>During Placement</i>	
Ongoing Waste Characterization	Required, details determined on a site-specific basis.
Ground-water Monitoring	<i>Substantively similar to federal SMCRA, plus:</i> Requirements specific to CCW placement determined on a site-by-site basis. The two active CCW placement projects require quarterly monitoring for all parameters, and monthly monitoring for indicators.
Performance Standards	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Enforceable Limits	<i>Substantively similar to federal SMCRA, plus:</i> Requirements specific to CCW placement determined on a site-by-site basis. The two active CCW placement projects have zero degradation standards for groundwater.
Corrective Action	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Operational Requirements/ Placement Engineering	<i>Substantively similar to federal SMCRA, plus:</i> Requirements specific to CCW placement determined on a site-by-site basis. Generally: <ul style="list-style-type: none"> • Placement of ash in coal mines is conducted to ensure isolation from both the hydrologic system and with extensive cover to isolate the materials from any root zone. • CCW volume restrictions are determined on a site-by-site basis. • Annual hydrology and reclamation reports are required at the two active CCW placement projects.
<i>Closure/Post Closure Care</i>	
Ongoing Ground-water Monitoring	<i>Substantively similar to federal SMCRA, plus:</i> Additional monitoring requirements may be applied on a case-by-case basis.
Performance Bonding or Financial Assurance	<i>Substantively similar to federal SMCRA, plus:</i> Additional financial assurance requirements may be applied on a case-by-case basis.
Other Closure/Post-closure Requirements	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

ILLINOIS

The Illinois Department of Natural Resources Office of Mines and Minerals (IOMM) has dual jurisdiction over disposal and beneficial use of CCW on abandoned and active mine sites with the Illinois Environmental Protection Agency (IEPA). The Illinois Environmental Protection Act allows for disposal of CCW in an active coal mine facility if the activity is provided for in the approved refuse disposal plan under the existing National Pollutant Discharge Elimination System (NPDES) and/or Subtitle D solid waste permits. Alternatively, the Act allows for disposal of CCW at an active coal mine if IOMM's CCW-specific disposal requirements are satisfied.

IOMM's CCW-specific disposal requirements (both law and policy) satisfy both the mining and the solid waste programs for CCW disposal. These requirements specify the need for separate approvals from IOMM and IEPA (which can be accomplished through a mining permit application or major revision) and include the following:

- Site characterization,
- Waste characterization (both pre-placement and during placement),
- Acid mine drainage
- State approval process,
- Ground-water monitoring,
- Performance standards,
- Enforceable limits,
- Corrective action, and
- Operational requirements/placement engineering.

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These requirements apply to active mines only, the requirements for CCW minefilling in abandoned mines are coordinated by IOMM and IEPA on a case-specific basis.

In addition, the beneficial reuse of CCW is statutorily allowed by IOMM for several purposes including mine subsidence control, mine fire control, mine sealing, and mine reclamation. IOMM policy regarding such uses is included in the table below.

References

Illinois Statutes: 415 ILCS 5/21(r); 415 ILCS 5/3.94 (P.A. 89-93); 225 ILCS 720

Illinois Regulations: 62 Ill. Adm. Code 1700 - 1850

Land Reclamation Memorandums 92-11, 95-8, and 95-9

Dan Wheeler, Office of Mines and Minerals, Illinois Department of Natural Resources and Larry Crislip, Mine Pollution Program, Illinois Environmental Protection Agency. Presentation at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

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ILLINOIS		
	Disposal	Beneficial Use
Regulatory Agency Oversight	<ul style="list-style-type: none"> Illinois Office of Mines and Minerals (IOMM) Illinois Environmental Protection Agency (IEPA) 	
Allowed Uses	<ul style="list-style-type: none"> Disposal in active mines. 	<ul style="list-style-type: none"> Mine subsidence control. Mine fire control. Mine sealing. Mine reclamation.
<i>Before Placement</i>		
Distinction Between Beneficial Use and Disposal	Projects where CCW placement exceeds 35% of the volume of coal extracted are defined as disposal.	Projects where CCW placement does not exceed 35% of the volume of coal extracted are defined as beneficial use.
Site Characterization	<i>Substantively similar to federal SMCRA, plus:</i> A summary of ground-water monitoring data for wells in the vicinity of the disposal area needs to be submitted in application.	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Siting Restrictions	<i>Substantively similar to federal SMCRA, no additional requirements.</i>	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Reclamation Plan	<i>Substantively similar to federal SMCRA, no additional requirements.</i>	<i>Substantively similar to federal SMCRA, no additional requirements, plus:</i> Any modifications to soil grading, covering and/or amendment, seeding and mulching activities related specifically to the application area shall be described.
Waste Characterization	<ul style="list-style-type: none"> Lab analysis for pH, alkalinity, acidity and TDS. TCLP for 19 metals and appropriate leaching procedure for chloride, cyanide, fluoride, and sulfate. A representative weighted composite for all constituents noted here, plus antimony, beryllium, and thallium. 	<ul style="list-style-type: none"> Evaluation for 19 constituents utilizing ASTM method D3987-85.

ILLINOIS		
	Disposal	Beneficial Use
Waste Characteristic Limits	None specified (<i>as per federal SMCRA</i>).	<ul style="list-style-type: none"> May not exceed Class I Ground-water Standards for metals.
Address Acid-Base Balance/Acid Mine Drainage	<ul style="list-style-type: none"> pH maintained so as to prevent excessive leaching of metal ions. 	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
State Approval Required to Proceed	<i>Substantively similar to federal SMCRA, plus:</i> Separate approvals (and separate permits) from IOMM and IEPA required. However, may be applied to jointly through an IOMM permit application or a major revision of an existing mining permit.	<i>Substantively similar to federal SMCRA, plus:</i> Beneficial uses may be applied for through a permit application, major or minor permit revision, or incidental boundary revision depending on the situation and magnitude of the changes proposed.
Public Participation	<i>Substantively similar to federal SMCRA, no additional requirements.</i>	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
<i>During Placement</i>		
Ongoing Waste Characterization	<ul style="list-style-type: none"> Quarterly sampling and reporting on each CCW source to establish baseline. Once baseline waste characteristics are consistently established, operator may request a modification of monitoring plan. Any changes in CCW source materials or mixture requires notification and submission of chemical analysis of the alternative waste source material or mixture. 	Not required (<i>as per federal SMCRA</i>).
Ground-water Monitoring	<i>Substantively similar to federal SMCRA, plus:</i> IOMM or IEPA require additional parameters to be added to the plan based on the potential for leaching as determined by waste mixture testing.	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Performance Standards	Must demonstrate adequate measures will be used to protect surface water and groundwater from contamination	Must demonstrate that the use of the CCW will have no adverse impacts to the environment.

ILLINOIS		
	Disposal	Beneficial Use
	at levels prohibited by the Illinois Environmental Protection Act and the Illinois Ground-water Protection Act.	
Enforceable Limits	<i>Substantively similar to federal SMCRA, plus:</i> May not exceed storm water and ground-water contamination levels established by the Illinois Environmental Protection Act and Ground-water Protection Act. If exceeded, corrective action requirements will apply.	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Corrective Action		
Operational Requirements/ Placement Engineering	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • CCW must come from a company that has purchased coal from the mine. • The amount of CCW disposed may not exceed 35% of annual coal sales. • Adequate protection from wind and water erosion required, including: goal of no visible emissions, and minimize contact with surface water and direct precipitation. • Liners may be required for disposal in certain ground-water classes. In-situ fire clay can meet the liner requirement. 	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • CCW cannot be mixed with hazardous waste. • Erosion control measures. • Dust control measures. • Maps of application areas. • Speculative accumulation is not permitted. • Notification, documentation of quality, and certification of compliance are required.
<i>Closure/Post Closure Care</i>		
Ongoing Ground-water Monitoring	<i>Substantively similar to federal SMCRA, plus:</i> Additional monitoring may be required on a case-by-case basis by IOMM/IEPA.	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Performance Bonding or Financial Assurance	<i>Substantively similar to federal SMCRA, no additional requirements.</i>	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

ILLINOIS		
	Disposal	Beneficial Use
Other Closure/Post-closure Requirements	<i>Substantively similar to federal SMCRA, no additional requirements.</i>	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

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INDIANA

The Indiana Department of Natural Resources, Reclamation Division (DNR-RD) has sole jurisdiction over the disposal and beneficial use of CCW on active mine sites and has developed policies addressing both. The disposal of CCW at mining facilities regulated by DNR-RD (under the IC 14-34 mining regulations) and the beneficial uses of CCW (as defined by DNR-RD policy) are exempt from the State's solid waste regulations. Under Indiana statutes, DNR-RD's regulation of mine sites can be no more stringent than federal SMCRA regulations. DNR-RD has, however, adopted policy that specifically details how it's SMCRA program requirements apply to the mine placement of CCW.

The DNR-RD preliminarily adopted in November 1998 a Proposed Coal Combustion Waste Disposal Rule (published in the Indiana Register on February 1, 1999). However, it has not attained final adoption and will not do so until the Indiana Department of Environmental Management adopts new ground-water standards. To date, this has not occurred. Until such time, DNR-RD's CCW disposal program will continue to fall under the authority of DNR's policy Memorandum 92-1. This policy addresses the following:

- Site characterization,
- Siting restrictions,
- Reclamation plan,
- Waste characterization (both pre-placement and during placement),
- Waste characteristic limits,
- State approval process,
- Ground-water monitoring (both during and after placement),
- Operational requirements/placement engineering, and
- Closure requirements.

The DNR-RD's beneficial use policy allows for several beneficial uses of CCW at mine sites, including: mine subsidence, mine fire control, and mine sealing. These uses are not regulated by DNR (under either the mining or solid waste programs), but written notification must be provided to DNR-RD prior to the planned use.

References

Indiana Statutes: IC 13-9-3-3; IC 14-34

Indiana Regulations: 310 IAC 12

DNR Memorandum 92-1: Disposal of Coal Combustion Waste on Surface Coal Mines. June 8, 1992.

DNR Memorandum 99-2: Beneficial Use of Coal Combustion Waste. July 12, 1999.

Bruce Stevens, Director, Reclamation Division, Indiana Department of Natural Resources (personal communication, 4/30/01)

Bruce Stevens, Director, Reclamation Division, Indiana Department of Natural Resources. Presentation at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

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INDIANA	
Regulatory Agency Oversight	<ul style="list-style-type: none"> • Indiana Department of Natural Resources, Reclamation Division (DNR-RD)
Allowed Uses	<ul style="list-style-type: none"> • Disposal in active surface mines. • Mine subsidence. • Mine fire control. • Mine sealing.
<i>Before Placement</i>	
Distinction Between Beneficial Use and Disposal	None specified.
Site Characterization	<i>Substantively similar to federal SMCRA, plus:</i> A minimum of six months of baseline monitoring for surface and groundwater (within 1,000 feet of the permit area) is required.
Siting Restrictions	<i>Substantively similar to federal SMCRA, plus:</i> The evaluation of a proposal to dispose CCW on surface mines considers the proximity of public and private water supplies or other critical off-site features.
Reclamation Plan	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • A description of how minimization of adverse impacts upon the prevailing hydrologic balance will be accomplished. • A description of approximate original contour, post-mining land use, and revegetation. • A description of the type of disposal operation (i.e., backfill, monofill). • Explain types of CCW to be disposed (e.g., fly ash, bottom ash, etc.). • Provide total volume of CCW to be disposed.
Waste Characterization	Bulk analysis, short- and long-term leaching tests that meet ASTM standards, includes 26 different constituents and parameters.
Waste Characteristic Limits	Leach test concentrations must not be greater than one-quarter the RCRA limit.
Address Acid-Base Balance/Acid Mine Drainage	<i>Substantively similar to federal SMCRA, no additional requirements.</i> (Note: according to DNR-RD, acid mine drainage is not a problem in Indiana, so no requirements in this area are needed.)
State Approval Required to	Disposal of CCW requires a major modification to the existing mining permit.

INDIANA	
Proceed	
Public Participation	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
<i>During Placement</i>	
Ongoing Waste Characterization	Quarterly monitoring is required. Sampling frequency may later be reduced.
Ground-water Monitoring	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • Testing must be conducted for 33 parameters. • Ground-water must be monitored at both upgradient and downgradient locations with at least one monitoring well in the expected path of leachate migration. • Results of the monitoring plan must be submitted in accordance with an approved schedule.
Performance Standards	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Enforceable Limits	<i>Substantively similar to federal SMCRA, no additional requirements – Note that IEPA has not yet promulgated ground-water quality standards.</i>
Corrective Action	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Operational Requirements/ Placement Engineering	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • Limited to CCW generated in Indiana or from coal mined in Indiana. • Can not exceed 10 feet of thickness unless approved as a monofill. • Can require a liner, but generally does not allow disposal in conditions that would require a liner. • CCW volume restrictions can be incorporated on a site-specific basis. (Proposed requirements would implement a volume restriction of 50% of coal removed.) <p>Operational plan must include:</p> <ul style="list-style-type: none"> • Description of proposed compaction. • Description of the methods to reduce infiltration or contact with water (e.g., liners, caps, co-disposal with coal processing waste, etc.). Liners, in most circumstances, are not required. • Detailed maps, plans, and cross-sections. • A dust control plan.

INDIANA	
<i>Closure/Post Closure Care</i>	
Ongoing Ground-water Monitoring	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Performance Bonding or Financial Assurance	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Other Closure/Post-closure Requirements	<i>Substantively similar to federal SMCRA, plus: Minimum final soil cover of five feet of non-toxic earthen material.</i>

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KANSAS

In Kansas, there is currently placement of CCW in one limestone mine but no active coal mines. If CCW mine placement were to occur in an active coal mine, it would be subject to applicable State mining regulations, which are substantively similar to the Federal SMCRA regulations. According to Murray Balk of the Bureau of Environmental Remediation, Surface Mining Section, internal policy would apply additional requirements to mine placement projects in the following areas:

- Site characterization,
- Reclamation plan,
- Operational requirements/placement engineering, and
- Financial assurance.

In addition, since CCW is defined as industrial solid waste, a solid waste disposal permit would be required for mine placement activity. Kansas' solid waste permit requirements are summarized in *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*, December 14, 2000. Because details regarding the applicability of these requirements to mine placement projects have not yet been tested through implementation, the requirements are not summarized here.

References

Kansas Statutes: KSA 65-3402(x); KSA 49 *et seq.*

Kansas Regulations: KAR 47-1 to 47-16

Murray Balk, Section Chief, Surface Mining Section, Bureau of Environmental Remediation, Kansas Department of Health and the Environment (personal communication, 4/24/01)

Stacey Balman, Bureau of Waste Management, Kansas Department of Health and the Environment (personal communication, 4/20/01)

KANSAS	
Regulatory Agency Oversight	Kansas Department of Health and the Environment: <ul style="list-style-type: none"> • Bureau of Environmental Remediation, Surface Mining Section (SMC) • Division of Environment, Bureau of Waste Management (BWM)
Allowed Uses	Mine placement.
<i>Before Placement</i>	
Distinction Between Beneficial Use and Disposal	None specified.
Site Characterization	<i>Substantively similar to federal SMCRA, plus:</i> Consideration would be made by the SMC as to the affect disposing of CCW would have on the hydrology and vegetation of the site.
Siting Restrictions	<i>Substantively similar to federal SMCRA, plus:</i> Additional restrictions may be imposed by the solid waste disposal permit.
Reclamation Plan	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • Consideration would be made by the SMC as to the affect disposing of CCW would have on the reclamation plan. • SMC would also look at whether the additional material may cause excess spoil problems which may cause difficulty meeting the "approximate original contour" requirements.
Waste Characterization	Not required (<i>as per federal SMCRA</i>).
Waste Characteristic Limits	None specified (<i>as per federal SMCRA</i>).
Address Acid-Base Balance/Acid Mine Drainage	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
State Approval Required to Proceed	<i>Substantively similar to federal SMCRA, plus:</i> Solid waste disposal permit required.
Public Participation	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

KANSAS	
<i>During Placement</i>	
Ongoing Waste Characterization	Not required (<i>as per federal SMCRA</i>).
Ground-water Monitoring	<i>Substantively similar to federal SMCRA, plus:</i> Additional monitoring might be required under the solid waste permit.
Performance Standards	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Enforceable Limits	<i>Substantively similar to federal SMCRA, no additional requirements – Note that there are no specific standards or mechanisms for corrective action embodied in Kansas' solid waste regulations.</i>
Corrective Action	
Operational Requirements/ Placement Engineering	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • Consideration would be made by the SMC as to the affect disposing of CCW would have on the operation plan. • Additional operational requirements might be imposed by the solid waste disposal permit.
<i>Closure/Post Closure Care</i>	
Ongoing Ground-water Monitoring	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Performance Bonding or Financial Assurance	<i>Substantively similar to federal SMCRA, plus:</i> Additional financial assurance requirements might be imposed by the solid waste disposal permit.
Other Closure/Post-closure Requirements	<i>Substantively similar to federal SMCRA, plus:</i> Additional closure/post-closure requirements might be imposed by the solid waste disposal permit.

KENTUCKY

Currently, there are only two sites authorized for CCW mine placement in Kentucky. The Kentucky Department for Surface Mining, Reclamation and Enforcement (DSMRE) addresses the disposal of CCW at surface mines with specific statutory provisions (found at 28 KRS Chapter 350.270). The regulations require a modification of the mining permit and include the following:

- Site characterization,
- Siting restrictions,
- Reclamation plan,
- Waste characterization (both pre-placement and during placement),
- Waste characteristic limits,
- State approval process,
- Public participation,
- Ground-water monitoring (both during and after placement),
- Enforceable limits (determined on a site-by-site basis),
- Operational requirements/placement engineering,
- Financial assurance, and
- Closure requirements.

Kentucky's Department for Environmental Protection, Division of Waste Management (DWM) classifies CCW as special waste, but allows for reuse and beneficial uses of CCW under a solid waste permit-by-rule (found at 401 KAR 45:060). One reuse option includes disposal at active surface coal mining operations if the operator has a mining permit issued under 28 KRS Chapter 350 that includes the disposal of special waste. In such a case, the solid waste permit-by-rule defers entirely to the mining permit. In addition, the beneficial use of CCW as mine stabilization and reclamation material may be authorized under the solid waste permit-by-rule provided that:

- The use of CCWs does not result in a nuisance condition,
- Erosion and sediment controls are undertaken,
- The use is at least 100 feet from a stream and 300 feet from potable wells, wetlands or flood plains,
- The generator characterizes the nonhazardous nature of the CCWs, and
- The generator submits an annual report identifying characteristics about the ash reused and where it is reused.

No beneficial uses of CCW at mine sites have occurred yet, but, according to Carole Ball (DSMRE), it is anticipated that such uses will occur in the future in the areas of abandoned lands for reclamation, stabilization, and acid mine drainage control.

References

Kentucky Statutes: 28 KRS 350.270; 28 KRS 350

Kentucky Regulations: 401 KAR 45:010 and 45:060

Carol Ball, Kentucky Department for Surface Mining, Reclamation and Enforcement (personal communication, 4/18/01)

Karl Campbell, Kentucky Department for Surface Mining, Reclamation and Enforcement. Comments at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

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KENTUCKY	
Regulatory Agency Oversight	Kentucky Natural Resources and Environmental Protection Cabinet: <ul style="list-style-type: none"> • Department for Surface Mining, Reclamation and Enforcement (DSMRE) • Department for Environmental Protection, Division of Waste Management (DEP-DWM)
Allowed Uses	Mine placement.
<i>Before Placement</i>	
Distinction Between Beneficial Use and Disposal	DEP-DWM permit-by-rule regulations classify use for mine stabilization and reclamation as beneficial use.
Site Characterization	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • Application must include baseline data to characterize ground and surface water quality. • Maps are required showing each disposal location.
Siting Restrictions	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • May be placed only in the pit or extraction area from which coal has been removed by surface mining (can go elsewhere if demonstrate no adverse impacts will occur). • Select area that will minimize water contact with the CCW. • For beneficial use under DEP-DWM permit-by-rule, the use must be at least 100 feet from a stream and 300 feet from potable wells, wetlands or flood plains.
Reclamation Plan	<i>Substantively similar to federal SMCRA, plus:</i> Application for disposal must include: <ul style="list-style-type: none"> • Legal right to conduct activity. • A public notice of the application. • Annual volume of CCW. • Description of proposed handling and disposal methods/operational procedures. • Description of measures to assure disposal won't threaten public health or disturb hydrologic balance.
Waste Characterization	Results of representative sampling and lab analysis of each component of the CCW is required. The analysis must include testing for 19 metals (specified in the statutory provisions), and the neutralization potential and potential acidity.

KENTUCKY	
Waste Characteristic Limits	<ul style="list-style-type: none"> • Must be non-hazardous as defined by KRS Chapter 224 and RCRA. • Must demonstrate that the CCW does not contain any contaminant at a concentration that meets or exceeds limits pursuant to KRS Chapter 224 and RCRA. • Additional limits determined on a site-by-site basis.
Address Acid-Base Balance/Acid Mine Drainage	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
State Approval Required to Proceed	Amendment or a major permit revision application is required to include disposal of CCW in the surface mining permit, if the activity wasn't included in the original permit application. The activity is also covered under a solid waste permit-by-rule which defers entirely to the mining permit.
Public Participation	<i>Substantively similar to federal SMCRA, plus:</i> Public notice of disposal of CCW in the mining permit area is required.
<i>During Placement</i>	
Ongoing Waste Characterization	The generator must obtain and submit an annual laboratory analysis characterizing the CCW.
Ground-water Monitoring	<i>Substantively similar to federal SMCRA, plus:</i> Additional parameters determined by the DSMRE based on demonstrated characteristics of the CCW.
Performance Standards	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Enforceable Limits	<i>Substantively similar to federal SMCRA, plus:</i> Enforceable limits determined by DSMRE on a site-by-site basis.
Corrective Action	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Operational Requirements/ Placement Engineering	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • Cannot mix CCW with low volume waste or material with hazardous waste characteristics. • CCW generated prior to a certain date may not be used, except on a case-by-case basis. • Place CCW at least 4 feet above seasonal high water table that is proposed after mining. • Do not place CCW within 4 feet of final high wall, exposed coal seam, or coal outcrop. • Prevent CCW from becoming airborne.

KENTUCKY	
	<ul style="list-style-type: none"> • Keep records of the source and amount of CCW received. • Maintain accurate maps showing each location where CCWs have been disposed of, and the volumes disposed of at each location. • Any material that is not the CCW approved for disposal must be removed. • Volume disposed can not exceed the in-place volumes of the marketable coal seams. • Can not result in greater amounts of excess spoil than if were not disposing CCW in mines. • Thickness shall not exceed 40 feet at any point.
<i>Closure/Post Closure Care</i>	
Ongoing Ground-water Monitoring	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • Required until final bond release on the permit area. • The monitoring must be conducted quarterly, except monitoring for the extra parameters due to disposal of CCW must be conducted semi-annually. • Monitoring for extra parameters may be reduced if those parameters show no increases of regulated levels after 4 monitoring events.
Performance Bonding or Financial Assurance	<i>Substantively similar to federal SMCRA, plus:</i> The performance bond required under the standard mining permit must cover disposal of CCW.
Other Closure/Post-closure Requirements	<i>Substantively similar to federal SMCRA, plus:</i> After disposal, CCW must be covered with at least 4 feet of non-acid forming spoil material.

LOUISIANA

In Louisiana, mine placement of CCW is not currently being done – one coal-burning power plant in the State disposes of its ash onsite. If CCW mine placement were to occur, it would be subject to applicable State mining regulations, which are substantively similar to Federal SMCRA regulations. Louisiana's solid waste program defines CCW as an industrial solid waste. According to the Office of Environmental Services' Permits Division, at present, the disposal of CCW is only allowed in permitted landfills and surface impoundments – not in mines.

References

Louisiana Regulations: 43 LAC 15

Tony Duplechin, Chief, Surface Mining Section, Injection & Mining Division, Louisiana Department of Natural Resources (personal communication, 4/30/01)

Tony Duplechin, Chief, Surface Mining Section, Injection & Mining Division, Louisiana Department of Natural Resources. Presentation at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

Thea Johnson, Louisiana Department of Environmental Quality, Office of Environmental Services, Permits Division (personal communication, 5/11/01)

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MARYLAND

CCWs are currently being used for reclamation activity at six coal mines and two non coal mines in Maryland. The Maryland Department of the Environment (MDE), Bureau of Mines has sole jurisdiction over the use/minefilling of CCW on mine sites. In such cases, the State's mining regulations, which are substantively similar to the federal SMCRA regulations, apply. In addition, the Bureau of Mines has issued policy guidelines for the use of CCW for mine reclamation. These guidelines require approval from the Bureau of Mines, but not a separate permit², and address the following for coal mines and aggregate mines:

- Site characterization,
- Reclamation plan,
- Waste characterization (pre-placement),
- Waste characteristic limits,
- State approval process, and
- Closure requirements.

MDE's Solid Waste Program allows the beneficial use of "pozzolans," including for the reclamation of mines. According to MDE, most coal ash (both fly ash and bottom ash) generated by pulverized coal plants operating in Maryland meets the definition of a pozzolan under Maryland law. Such ash is exempt from the requirement to obtain a solid waste disposal permit if the following beneficial use conditions are met:

- Sound engineering practices followed,
- Dust and wind erosion minimized, and
- All silt control regulations and permit requirements of the MDE met.

² For aggregate mine reclamation: In locations where there may be a threat to water quality, an NPDES or State permit to protect groundwater may be necessary.

References

Maryland Statutes: MD ANN.CODE 15-407

Maryland Regulations: COMAR 26.04.07.04(C)(7); COMAR 26.21.01 *et seq.*

MDE Bureau of Mines Memo: Ash Utilization/Disposal Requests. March 10, 1997.

MDE Bureau of Mines Coal Ash Utilization/Disposal Request (form)

Mark Carney, Coal Mining Division, Bureau of Mines, Maryland Department of the Environment (personal communication, 4/30/01 and 6/15/01)

Edward Dexter, Chief, Field Operations & Projects Division, Solid Waste Program, Maryland Department of the Environment (personal communication, 5/4/01)

Connie Lyons, Mining Program, Maryland Department of the Environment. Presentation at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

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MARYLAND	
Regulatory Agency Oversight	Maryland Department of the Environment: <ul style="list-style-type: none"> • Bureau of Mines, Coal Mining Division (coal mines) • Bureau of Mines, Minerals, Oil, and Gas Division (aggregate mines) • Solid Waste Program
Allowed Uses	<ul style="list-style-type: none"> • Aggregate mine reclamation or coal mine reclamation.
<i>Before Placement</i>	
Distinction Between Beneficial Use and Disposal	None specified.
Site Characterization	<i>Substantively similar to federal SMCRA, plus:</i> Water quality analysis for the mine permit drainage control system is required for 20 parameters.
Siting Restrictions	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Reclamation Plan	<i>Substantively similar to federal SMCRA, plus:</i> For coal mine reclamation, the following information is required: <ul style="list-style-type: none"> • General information from the applicant's coal mine permit. • A general disposal plan, including a map and narrative description of site handling, storage, and application procedures. Explanation of how dust will be controlled and how contamination of surface and groundwater will be prevented. For aggregate mine reclamation, requirements are established on a site-by-site basis.
Waste Characterization	For coal mine reclamation: <ul style="list-style-type: none"> • Identification of the type and source of CCW. • Solids analysis for 14 parameters. • Leachate analysis (TCLP) for 11 parameters. For aggregate mine reclamation, requirements are established on a site-by-site basis.
Waste Characteristic Limits	For coal mine reclamation, CCWs must be nonhazardous, as demonstrated by TCLP analyses. For aggregate mine reclamation, limits are established on a site-by-site basis.

MARYLAND	
Address Acid-Base Balance/Acid Mine Drainage	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
State Approval Required to Proceed	Must obtain approval from MDE through a minor amendment to the existing mining and reclamation permit.
Public Participation	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
<i>During Placement</i>	
Ongoing Waste Characterization	Not required (<i>as per federal SMCRA</i>)
Ground-water Monitoring	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Performance Standards	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Enforceable Limits	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Corrective Action	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Operational Requirements/ Placement Engineering	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
<i>Closure/Post Closure Care</i>	
Ongoing Ground-water Monitoring	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Performance Bonding or Financial Assurance	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Other Closure/Post-closure Requirements	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

MICHIGAN

There are currently no active coal mines in Michigan. Any future active coal mines, and the placement of CCW in those mines, would be subject to applicable Federal mining regulations – the coal mining program would be administered by US Department of the Interior’s Office of Surface Mine Reclamation and Enforcement (OSM) rather than the State. There are, however, abandoned and active mineral mines regulated by the State, and there is currently CCW placement in one limestone mine. The State’s mineral mines regulatory programs do not contain provisions specifically addressing the placement of CCW. The Michigan Department of Environmental Quality, Waste Management Division, however, manages CCW under solid waste regulations that specifically address its use as the sole material in a depository designed to reclaim, develop, or otherwise enhance land. These regulations, require reclamation plan approval rather than a solid waste disposal permit (CCW is exempt as a solid waste if used and approved in accordance with the CCW-specific regulations) and include the following:

- Site characterization,
- Siting restrictions,
- Reclamation plan,
- Demonstration of benefit,
- Waste characterization (pre-placement),
- Waste characteristic limits (established on a site-by-site basis),
- State approval process,
- Financial assurance, and
- Closure requirements.

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Reference

Michigan Regulations: Solid Waste Management, General Provisions, R 299.4113- 4119, 4305, 4446, and 5711.

Joan Peck, Michigan Department of Environmental Quality, Waste Management Division (personal communication, 6/11/01)

MICHIGAN	
Regulatory Agency Oversight	<ul style="list-style-type: none"> Michigan Department of Environmental Quality, Waste Management Division
Allowed Uses	As the sole material in a depository designed to reclaim, develop, or otherwise enhance land.
<i>Before Placement</i>	
Distinction Between Beneficial Use and Disposal	None specified.
Site Characterization	<ul style="list-style-type: none"> Must include topographic maps, and documentation of landowner authorization. Demonstrate that site conditions are sufficient to prevent the migration of ash constituents in a manner that will violate water quality performance standards. Non-inert ash projects must include engineering plans and hydrogeological report demonstrating certain water quality performance standards.
Siting Restrictions	<ul style="list-style-type: none"> No closer than 100 ft. to adjacent property lines, road rights-of-way, or lakes and perennial streams closer than 300 ft. to domiciles (greater distances required in certain situations). Not within a floodplain or wetland (some possible exceptions).
Reclamation Plan	<p>Facilities must submit a reclamation plan to the DEQ that:</p> <ul style="list-style-type: none"> Describes how the proposed use will reclaim, develop, or enhance the land. Demonstrates that the ash is either inert, that the site conditions are sufficient to prevent the migration of constituents, or that the plan is otherwise protective of human health and the environment. Includes a closure plan. Details post-closure restrictions.
Waste Characterization	<ul style="list-style-type: none"> Must demonstrate ash is inert (non-inert ash may still be disposed but with additional requirements). Ash is considered inert if the generator notifies DEQ of the reuse, maintains characterization records for at least 3 years, and demonstrates that the concentration of hazardous substances in the CCW is below 1 of the following criteria: (1) the background concentration of the substance(s) in question, (2) the method detection limit for the substance(s), and (3) the Type B criteria for soil which means the concentrations must be at levels as required to protect surface and groundwater and against unacceptable risk through direct contact, and TCLP testing must demonstrate compliance with ground-water criteria. Additional limits established on a site-by-site basis.
Waste Characteristic Limits	

MICHIGAN	
Address Acid-Base Balance/Acid Mine Drainage	None specified.
State Approval Required to Proceed	Reclamation plan must be approved by the DEQ. It will be approved if the rule requirements and any other applicable State law are followed and the activity is demonstrated to not create a nuisance.
Public Participation	Not required.
<i>During Placement</i>	
Ongoing Waste Characterization	Not required.
Ground-water Monitoring	Not required.
Performance Standards	None specified.
Enforceable Limits	None specified.
Corrective Action	Not required.
Operational Requirements/ Placement Engineering	None specified.
<i>Closure/Post Closure Care</i>	
Ongoing Ground-water Monitoring	Not required.
Performance Bonding or Financial Assurance	Restrictive covenant required.
Other Closure/Post-closure Requirements	<p>Closure plan required, including:</p> <ul style="list-style-type: none"> • Overall description of the methods, procedures, processes, and schedule that will be used. • Description of final cover, including engineering plans and specifications. <p>Restrictions on post-closure use.</p>

MISSOURI

The Missouri Department of Natural Resources (DNR) Land Reclamation Program (LRP) regulates placement of CCW in coal and non-coal mines only when the Solid Waste Management Program (SWMP) grants a beneficial use/reclamation exemption (see below). In such a case, the State mining regulations, which are substantively similar to the Federal SMCRA regulations, apply and a major revision of the coal mining and reclamation permit would be required (there are separate applicable non-coal regulations). In amending the permit to account for CCW placement, the LRP addresses the following:

- Reclamation plan,
- State approval process,
- Ground-water monitoring (both during and after placement), and
- Closure requirements.

LRP's permitting requirements are less involved for industrial minerals operations – quarries, sand and gravel mines, and clay pits. For example, the Land Reclamation Act does not provide for water monitoring at industrial minerals sites, and the LRP cannot require testing for CCW solutes at these operations. The LRP's primary concern for such sites is that CCW be adequately covered in a timely manner with root-growth medium (if the site is to be revegetated) or capped with a durable cover.

Under DNR's Solid Waste Management Program, a beneficial use/reclamation exemption from having to obtain a solid waste permit may be granted for certain uses of CCW. A beneficial use exemption would be granted only after consultations with other interested programs within DNR, including LRP. For CCW mine uses with a beneficial use exemption, the solid waste regulations impose requirements in the following areas:

- Site characterization,
- Reclamation plan,
- Waste characterization (pre-placement),
- State approval process, and
- Operational requirements/placement engineering

In addition to the beneficial use exemption described here, there is also a provision exempting from solid waste permitting requirements fly ash produced by coal combustion in certain counties “if such ash is constructively reused or disposed of by a grout technique in any active or inactive non-coal, non-open-pit mining operation located in a city having a population of at least three hundred fifty thousand

located in more than one county and is also located in a county of the first class without a charter form of government with a population of greater than one hundred fifty thousand and less than one hundred sixty thousand, provided said ash is not considered hazardous waste under the Missouri hazardous waste law.” (RSMo 16-260.242).

If a beneficial use exemption is not granted, a solid waste disposal permit would be required for mine placement activity. Missouri's solid waste permit requirements are summarized in *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*, December 14, 2000. Because details regarding the applicability of these requirements to mine placement projects have not yet be tested through implementation, the requirements are not summarized here.

References

Missouri Statutes: RSMo 16-260.242; RSMo Chapters 444.800 - 444.970

Missouri Regulations: 10 CSR 80-2.020(9); 10 CSR 40 *et seq.*

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Brian Hicks, Land Reclamation Program, Missouri Department of Natural Resources (personal communication, 4/27/01 and 7/2/01)

Scott Waltrip, Solid Waste Program, Missouri Department of Natural Resources (personal communication, 6/11/01)

Scott Waltrip, Solid Waste Program, Missouri Department of Natural Resources and Brian Hicks, Land Reclamation Program, Missouri Department of Natural Resources. Presentation at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

MISSOURI	
Regulatory Agency Oversight	Missouri Department of Natural Resources (DNR): <ul style="list-style-type: none"> • Land Reclamation Program (LRP) • Solid Waste Management Program (SWMP)
Allowed Uses	Beneficial uses as authorized by the SWMP as part of mine reclamation.
<i>Before Placement</i>	
Distinction Between Beneficial Use and Disposal	The use CCW on a mine site is considered beneficial use provided beneficial use and/or reclamation can be demonstrated and provided that pollution, a public nuisance, or a health hazard will not be created.
Site Characterization	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • Analysis of the physical and chemical characteristics of water quality and background soils is required. • Verification by certified hydrogeologist that placement is above the water table.
Siting Restrictions	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Reclamation Plan	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • Explanation of the beneficial use or reclamation. • Documentation identifying the site location, surrounding land use, and site characteristics. • An estimate of the quantity of CCW to be disposed and the time required for disposal procedures. • Management plan. • Contingency plan. • CCW handling plan – in part addressing where the materials will be placed in relation to the expected water table in the backfilled spoil.
Waste Characterization	If placement is covered by an engineered clay cap, the only characterization requirement is to show the CCW is non-hazardous using TCLP. If there is any potential for groundwater contact or no cap, ASTM characterization is required.
Waste Characteristic Limits	
Address Acid-Base Balance/Acid Mine Drainage	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
State Approval Required to Proceed	<i>Substantively similar to federal SMCRA, plus:</i> A request for a beneficial use/reclamation exemption must be approved by SWMP, and a major revision of the mining and reclamation permit must be obtained.

MISSOURI	
Public Participation	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
<i>During Placement</i>	
Ongoing Waste Characterization	Not required (<i>as per federal SMCRA</i>)
Ground-water Monitoring	<i>Substantively similar to federal SMCRA, plus:</i> Annual ground-water monitoring for 16 parameters.
Performance Standards	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Enforceable Limits	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Corrective Action	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Operational Requirements/ Placement Engineering	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • Must include a description of the proposed operational procedures for waste disposal (including compaction, dust control, and erosion control) and procedures for any complications that may arise. • CCW must be place above the seasonal high ground-water table unless a variance is obtained.
<i>Closure/Post Closure Care</i>	
Ongoing Ground-water Monitoring	<i>Substantively similar to federal SMCRA, plus:</i> Ongoing ground-water monitoring may be required if deemed necessary.
Performance Bonding or Financial Assurance	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Other Closure/Post-closure Requirements	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

MONTANA

Montana's Department of Environmental Quality, Industrial and Energy Minerals Bureau has sole jurisdiction over the disposal of CCW in permitted mines. Montana has developed specific mining regulations that apply to the use of CCW as fill material or for disposal in permitted strip or underground mines. These regulations, require that the mine operator obtain approval for the CCW activity as part of the mining permit and address the following:

- Site characterization,
- Reclamation plan,
- Performance standards,
- Waste characterization
- Waste characteristic limits,
- State approval process,
- Ground-water monitoring (both during and after placement),
- Enforceable limits,
- Operational requirements/placement engineering,
- Financial assurance, and
- Closure requirements.

Montana's solid waste regulations include CCW in the definition of an industrial solid waste. However, a solid waste disposal permit is not required for CCW mine placement if the mine is permitted by the Industrial and Energy Minerals Bureau.

References

Montana Statutes: MCA 82-4 *et seq.*

Montana Regulations: ARM 17.24.510; ARM 17.24

Neil Harrington, Industrial and Energy Minerals Bureau, Coal and Uranium Program (personal communication, 4/23/01 and 6/28/01)

Rick Thompson, Community Services Bureau, Waste Management Section (personal communication, 4/24/01)

MONTANA	
Regulatory Agency Oversight	Montana Department of Environmental Quality, Industrial and Energy Minerals Bureau
Allowed Uses	Fill material or disposal in strip or underground mines.
<i>Before Placement</i>	
Distinction Between Beneficial Use and Disposal	None specified.
Site Characterization	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Siting Restrictions	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Reclamation Plan	<i>Substantively similar to federal SMCRA, plus:</i> Must specify disposal procedures, the hydrological means, and the chemical and physical analyses that will be conducted to demonstrate that will not adversely affect water quality, public health or safety, or other environmental resources, and will not cause instability in the backfilled area.
Waste Characterization	Chemical and physical analyses as necessary to support demonstration above.
Waste Characteristic Limits	The CCW cannot exceed hazardous waste characteristic limits.
Address Acid-Base Balance/Acid Mine Drainage	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
State Approval Required to Proceed	Prior approval from IEMB is required as a component of the mining permit. The relative significance of the proposal would dictate whether a minor or a major modification of the permit would be necessary. A major revision is any change in the mining or reclamation plan that: (1) results in a significant change in the postmining drainage plan; (2) results in a change in the postmining land use; (3) results in a significant change in the bonding level within the permitted area; or (4) results in a change that may affect the reclaimability of the area or the hydrologic balance on or off of the permitted area.
Public Participation	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

MONTANA	
<i>During Placement</i>	
Ongoing Waste Characterization	Not required (<i>as per federal SMCRA</i>)
Ground-water Monitoring	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • Ground-water levels, infiltration rates, subsurface flow and storage characteristics, and the quality of groundwater must be monitored, and in a manner approved by IEMB. • Must include the measurement of the quality and quality of water in all disturbed or potentially affected geologic strata within and adjacent to the permit area. • IEMB may require an expansion of the ground-water monitoring system whenever a significant impact is likely. • Results must be reported semiannually and data kept current at the mine office for inspection.
Performance Standards	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Enforceable Limits	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Corrective Action	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Operational Requirements/ Placement Engineering	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • Must conduct operations so as to minimize water pollution and, where necessary, use treatment methods to control water pollution, for example: divert runoff, use temporary vegetation, line drainage channels with rock or vegetation, or use mulching. • Backfilled materials must be placed to minimize adverse effects on ground-water flow and quality, to minimize off-site effects, and to support approved post-mining land use. • Compaction, contamination, and degradation of stockpiles must be minimized and the biological properties of the soil maintained.

MONTANA	
<i>Closure/Post Closure Care</i>	
Ongoing Ground-water Monitoring	<i>Substantively similar to federal SMCRA, plus: Ground-water monitoring must continue until phase IV bond release.</i>
Performance Bonding or Financial Assurance	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Other Closure/Post-closure Requirements	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

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NEW MEXICO

In New Mexico, CCWs are not defined as a solid waste and are exempt from all solid waste regulations. Therefore, the New Mexico Department of Energy, Minerals, and Natural Resources, Division of Mining and Materials (DMNR) has sole jurisdiction over the placement of CCW in mines. DMNR issues a modified mining and reclamation permit for CCW placement under State regulations that are substantively similar to the federal SMCRA regulations. In addition, the State has internal policy that applies additional requirements to mine placement projects in the following areas:

- Site characterization,
- Siting restrictions,
- Reclamation plan,
- Waste characterization,
- State approval process,
- Operational requirements/placement engineering,
- Ongoing ground-water monitoring, and
- Closure requirements.

The guidelines regarding the placement of CCW in mines are not found in the State statutes, regulations, or written policy, but rather are at the discretion of the State as deemed appropriate on a site-by-site basis. The requirements explained in the table are those deemed necessary for the two CCW mine placement site currently operating in New Mexico.

References

New Mexico Regulations: 19 NMAC 8.2

Anderson, Monte. *New Mexico's Regulatory Requirements for the Use of Coal Combustion By-Products*. 1996 Coal Combustion By-Products Forum.

Monte Anderson, New Mexico Department of Energy, Minerals, and Natural Resources, Division of Mining and Materials (personal communication, 6/11/01)

NEW MEXICO	
Regulatory Agency Oversight	New Mexico Department of Energy, Minerals, and Natural Resources, Division of Mining and Materials
Allowed Uses	Placement in permitted mines.
<i>Before Placement</i>	
Distinction Between Beneficial Use and Disposal	None specified.
Site Characterization	<i>Substantively similar to federal SMCRA, plus:</i> Sample water quality of coal seam aquifer.
Siting Restrictions	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Reclamation Plan	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • CCW disposal plan is incorporated into mining reclamation plan. • Must include a map of the disposal area.
Waste Characterization	Conduct leachate studies of CCW, as well as compaction and permeability tests.
Waste Characteristic Limits	None specified (<i>as per federal SMCRA</i>).
Address Acid-Base Balance/Acid Mine Drainage	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
State Approval Required to Proceed	Upon approval, the CCW disposal plan is incorporated into the mining permit (is not considered a permit modification).
Public Participation	Not required.
<i>During Placement</i>	
Ongoing Waste Characterization	Not required (<i>as per federal SMCRA</i>).

NEW MEXICO	
Ground-water Monitoring	<i>Substantively similar to federal SMCRA, plus: Quarterly monitoring of the chemical parameters that make up the CCW.</i>
Performance Standards	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Enforceable Limits	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Corrective Action	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Operational Requirements/ Placement Engineering	<i>Substantively similar to federal SMCRA, plus: Drainages that run above disposal areas should have low drainage gradients.</i>
<i>Closure/Post Closure Care</i>	
Ongoing Ground-water Monitoring	<i>Substantively similar to federal SMCRA, plus: Following reclamation, lysimeters may be required to monitor any saturation.</i>
Performance Bonding or Financial Assurance	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Other Closure/Post-closure Requirements	<i>Substantively similar to federal SMCRA, plus: Disposal areas are to be covered by spoil materials in addition to topsoil material.</i>

NORTH DAKOTA

The North Dakota Public Service Commission, Reclamation Division (PSC) has dual jurisdiction with the North Dakota Department of Health, Division of Solid Waste Management (DOH) over placement of CCW in mines. Such activity is subject to State mining regulations, which are substantively similar to the federal SMCRA regulations, and additional PSC policy. PCS's policy speaks to the performance bond and closure process in instances where mines are being used as a disposal facility and, therefore, are also regulated by DOH.

Mines used for CCW disposal are permitted by DOH as special waste landfills. The solid waste management permit is reviewed by PSC before final issuance. The regulatory provisions and DOH policy provisions for mines regulated as special waste landfills include:

- Site characterization,
- Siting restrictions,
- Reclamation plan,
- Performance standards,
- Waste characterization (both pre-placement and during placement),
- State approval process,
- Ground-water monitoring (both during and after placement),
- Operational requirements/placement engineering,
- Financial assurance, and
- Closure requirements.

References

North Dakota Statutes: NDCC 38-14.1

North Dakota Regulations: NDAC 33-20-04, 33-20-07, 33-20-13, 33-20-14, and 69-05.2.

Policy Memorandum No. 15 to Mine Operators: Performance Bond Release for Waste Disposal Operations Located on Mined Lands. January 13, 1999.

Jim Deutsch, Director, Reclamation Division, North Dakota Public Service Commission (personal communication, 5/8/01)

Steve Tillotson, Asst. Director, Division of Solid Waste Management, North Dakota Department of Health (personal communication, 5/8/01 and 6/18/01)

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NORTH DAKOTA	
Regulatory Agency Oversight	<ul style="list-style-type: none"> • North Dakota Public Service Commission, Reclamation Division (PSC) • North Dakota Department of Health, Division of Solid Waste Management (DOH)
Allowed Uses	Mine placement.
<i>Before Placement</i>	
Distinction Between Beneficial Use and Disposal	None specified.
Site Characterization	<p><i>Substantively similar to federal SMCRA, plus:</i></p> <p>The site characterization must address the following:</p> <ul style="list-style-type: none"> • Location and water quality of the waterbodies and wells within one mile of the site boundary. • Site location in relation to the 100-year floodplain.
Siting Restrictions	<p><i>Substantively similar to federal SMCRA, plus:</i></p> <ul style="list-style-type: none"> • Not within an area which may result in impacts to human health or environmental resources. • Not within an aquifer or wellhead protection area. • Not within 1,000 feet to a downgradient drinking water supply well (may be waived). • Not within 100-year floodplain. • Not where geologic or manmade features may result in differential settlement • Not within unstable slopes. • Not within woody draws. • Not within mine high walls. • Not within endangered or threatened species habitats. • Not within 200 feet horizontally from the ordinary high water elevation of any surface water or wetland (may be waived).
Reclamation Plan	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Waste Characterization	Waste characterization is required using USEPA's physical and chemical test methods for evaluating solid waste (including TCLP analysis). The regulations do not have specific requirements for waste characterization, rather the necessary testing is determined on a case-by-case basis. DOH's preferred test is the ASTM D-3987 test which mimics rainfall interaction with the waste.
Waste Characteristic Limits	None specified (<i>as per federal SMCRA</i>).

NORTH DAKOTA	
Address Acid-Base Balance/Acid Mine Drainage	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
State Approval Required to Proceed	<i>Substantively similar to federal SMCRA, plus:</i> Must obtain a solid waste disposal permit from DOH and obtain specific PSC approval for CCW placement.
Public Participation	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
<i>During Placement</i>	
Ongoing Waste Characterization	Not required.
Ground-water Monitoring	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • Include at least one upgradient well and at least 2 downgradient wells. • A minimum of four independent samples from each well must be collected for analysis during the first sampling event for establishing background data. • Monitoring for several additional parameters required.
Performance Standards	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Enforceable Limits	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Corrective Action	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • If a statistically significant increase over background values or an exceedance of a maximum concentration limit or water quality standard, the operator must initiate an assessment of remedial measures. • Based on the results of the assessment, the operator must select a corrective action remedy within thirty days which is protective of human health and environmental resources and attains ground-water protection standards. • Must have adequate financial assurance to cover any corrective actions.

NORTH DAKOTA	
Operational Requirements/ Placement Engineering	<p><i>Substantively similar to federal SMCRA, plus:</i></p> <ul style="list-style-type: none">• An operation plan with procedures for managing the CCW.• A liner is required, but typically a leachate removal system is not. (Note: This is a requirement under the solid waste program)• Spread and compact waste as densely as possible.• Control run-on and runoff.• Fugitive dust controls.• Intermediate cover (8 inches of clay or synthetic material).

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NORTH DAKOTA	
Closure/Post Closure Care	
Ongoing Ground-water Monitoring	<p><i>Substantively similar to federal SMCRA, plus:</i></p> <ul style="list-style-type: none"> • Must continue during post-closure period.
Performance Bonding or Financial Assurance	<p><i>Substantively similar to federal SMCRA, plus:</i></p> <ul style="list-style-type: none"> • Must have adequate financial assurance to cover costs of closure and post-closure care. The mechanisms may include a reserve account, trust fund, surety bond, letter of credit, financial test, insurance policy, or corporate guarantee. • Before granting final bond release on mined areas used for long-term waste disposal activities, the PSC will require a showing that sufficient topsoil and subsoil have been set aside to provide a total respread thickness of at least 24 inches of soil for sites where the cover material is non-sodic spoil and 36 inches where the cover is sodic spoil, with a minimum topsoil thickness of 8 inches.
Other Closure/Post-closure Requirements	<p><i>Substantively similar to federal SMCRA, plus:</i></p> <ul style="list-style-type: none"> • Closure and post-closure plans required. • Closure within 30 days of final disposal activity. • A final cap with a depth of least 5 feet (compacted clay or synthetic material, and a layer for plant growth) that ensures the quality and integrity of the hydraulic barrier and the vegetative cover. • Post-closure maintenance and monitoring for 30 years. • Post-closure corrective action activities may be required. • Vegetative cover must be good enough to provide long-term site stability and the capability to produce hay crops.

OHIO

Under State law as amended March 18, 1999, the Ohio Department of Natural Resources, Division of Mineral Resources Management (DMRM) has sole jurisdiction over the beneficial use of CCW on mine sites. No regulations have been developed pertaining to CCW beneficial uses, but DMRM has created draft policy guidelines that detail the allowable beneficial uses and the controls on their use. The provisions of the policy guidelines include:

- Site characterization,
- Siting restrictions,
- Waste characterization (both pre-placement and during placement),
- Waste characteristic limits,
- Acid-base accounting,
- State approval process,
- Public participation,
- Ground-water monitoring, and
- Operational requirements/placement engineering,

These guidelines supplement existing State mining regulations, which are substantively similar to the federal SMCRA regulations, and apply the SMCRA provisions for non-coal mine waste disposal to CCW placement. The policy guidelines were developed for active coal mine sites and will be used as a reference for abandoned mine lands projects.

Beneficial uses of CCW, as defined and controlled by DMRM, do not require a solid waste disposal permit. Mine placement that does not obtain DMRM's approval as a beneficial use would be regulated as disposal by the Ohio Environmental Protection Agency, Division of Solid and Infectious Waste Management (DSW). Under Ohio's solid waste regulations, fly ash and bottom ash that test as "non-toxic"³ are exempt from the definition of solid waste and from the solid waste permitting regulations. However, DSW has issued detailed policy guidelines regarding non-toxic CCW monofills. DSW has plans to convert the policy into enforceable law but the process has not yet begun. These policy guidelines require multi-media permitting and include:

- Site characterization (may be required on a site-by-site basis),

³ Based on available characterization data and anecdotal information from DSW, most fly ash and bottom ash would meet this definition.

- Siting restrictions,
- Waste characterization (both pre-placement and during placement),
- Waste characteristic limits,
- State approval process,
- Ground-water monitoring (both during and after placement may be required on a site-by-site basis),
- Enforceable limits,
- Operational requirements/placement engineering, and
- Closure requirements.

DSW has additional, more stringent regulatory requirements for CCW that does not meet the definition of “non-toxic.” These solid waste regulatory requirements are summarized in *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*, December 14, 2000 and are not included in this summary.

References

Ohio Statutes: ORC 1513.02(A)(7); ORC 1513 and 1514

Ohio Regulations: OAC 1501:13-9-09; OAC 1501:13

DSW Policy 0400.028: Disposal of Non-Toxic Bottom Ash, Fly Ash and Spent Foundry Sand, and Other Exempted Wastes. June 9, 1994.

Annette DeHavilland, Ohio Environmental Protection Agency, Division of Solid and Infectious Waste Management (personal communication, 6/13/01)

Mike Dillman, Ohio Department of Natural Resources, Division of Mineral Resources Management (personal communication, 5/4/01)

Bob Baker, Ohio Department of Natural Resources, Division of Mineral Resource Management. Presentation at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

OHIO		
	Disposal	Beneficial Use

Regulatory Agency Oversight	Ohio Environmental Protection Agency, Division of Solid and Infectious Waste Management (DSW)	Ohio Department of Natural Resources, Division of Mineral Resources Management (DMRM)
Allowed Uses	Disposal at mine sites.	<ul style="list-style-type: none"> Land reclamation uses (neutralization of coal refuse, neutralization of spoil, lining of pit floors for neutralization, reduce potential for acid mine drainage formation, sealing of toxic material). Land application uses for agronomic value. Mine sealing.
<i>Before Placement</i>		
Distinction Between Beneficial Use and Disposal	Any placement not meeting the constraints at right is defined as disposal. (In practice, DMRM has used the volume of CCW to be placed to determine that a project constitutes disposal.)	<ul style="list-style-type: none"> Use must not be in a manner that is equivalent to a disposal system or a solid waste disposal facility. Use must be unlikely to adversely affect human health, human safety, or the environment. Use must be unlikely to degrade existing land, air, or water quality.
Site Characterization	May be required on a site-by-site basis.	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> Background water quality sampling under seasonal conditions is usually necessary in order to characterize existing conditions before CCW use begins. The number of monitoring points needed to assess the potential impact will be required.
Siting Restrictions	Ash may not be placed: <ul style="list-style-type: none"> Within the surface or subsurface areas surrounding a public water well. Above a federally declared aquifer. In a sand or gravel pit. In a limestone or sandstone quarry. In an area of potential subsidence due to an underground mine. Within 1000 feet of a water supply well or developed spring (some exceptions). 	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> Not within 100 feet of streams (unless variance approved). Distance may be increased for exceptionally high value streams. Not within 100 feet of high-quality wetlands. Distance may be increased if necessary. Not within 500 feet upgradient of a surface drinking water source or within 300 feet of a ground-water source.

Reclamation Plan	Not required.	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Waste Characterization	<ul style="list-style-type: none"> Representative samples of waste must be obtained and characterized using the TCLP acid extraction test or a modified TCLP extraction test. Three initial test results for each parameter (21 total) are required to show compliance with the non-toxic criteria, where applicable. An organic or dioxin analysis of the simulated leachate, or a chemical analysis of the dry material, may be required on a case-by-case basis. 	<ul style="list-style-type: none"> Required prior to submittal for CCW and any associated material. TCLP for arsenic, barium, cadmium, chromium, lead, mercury, selenium, pH, acidity, alkalinity, aluminum, chloride, sodium, iron, manganese, sulfate, TDS, fluoride, silver, zinc. Material characterization (total) for pH, percent sulfur, potential acidity, neutralization potential, net neutralization potential. For use as soil additive: pH, boron, soluble salts, phosphorus, potassium, calcium, cation exchange capacity.
Waste Characteristic Limits	To be defined as non-toxic, TCLP levels may not exceed 30 times State MCLs for the RCRA toxicity metals other than silver. DSM has additional, more stringent regulatory requirements for CCWs that do not meet this definition.	<ul style="list-style-type: none"> Maximum acceptable leachate concentrations are 30 times State MCLs for arsenic, barium, cadmium, chromium, lead, mercury, selenium. For alkaline addition: pH between 6.5 and 12.5. For low permeability use: pH between 6.5 and 12.5, hydraulic conductivity 1×10^{-7} cm/sec. For use as soil additive: boron less than 4 ppm (hot water extraction method, soluble salts (conductivity) less than 2 mmhos when mixed with the surface materials.
Address Acid-Base Balance/Acid Mine Drainage	Not required.	<i>Substantively similar to federal SMCRA, plus:</i> Alkaline addition use requires complete acid/base accounting of the CCW and the associated material (spoil, coal refuse, etc.). Calcium carbonate deficiency must be more negative than -5 tons CaCO_3 per 1,000 tons of material.
State Approval Required to Proceed	After a site inspection and consultations with the Ohio EPA district office personnel, a permit to install application, detailed plans, an air permit to operate	Usually a major revision to a mining permit if proposed through an application to revise a permit.

	application, and an NPDES permit application need to be submitted.	
Public Participation	Not required.	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> Proposals must include the consent of the owner of the land where CCW is to be placed. If a major revision, must meet public notification/comment requirements of State law. New permit applications are required to address CCW in the public notice.
<i>During Placement</i>		
Ongoing Waste Characterization	At a minimum, annual tests must be performed on the materials and submitted. Additional analyses are required for any change in operations that generate waste.	Characterization required annually or when significant changes in CCW source or combustion/pollution control procedures.
Ground-water Monitoring	May be required on a site-by-site basis.	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> Monitoring may be required for additional parameters. If required, monitoring is normally quarterly, but may be required at another frequency determined during the review process. Monitoring points typically associated with active coal mines are, in most cases, capable of providing information on the effects of CCW placement. Monitoring points can be existing wells, springs, seeps, mine discharges, streams, ponds, or other sites. Upgradient and downgradient monitoring points will depend on the configuration of placement, volume of CCW, and existing conditions at the site.
Performance Standards	None specified.	<i>Substantively similar to federal SMCRA, plus:</i> The use of CCW shall be designed to: <ul style="list-style-type: none"> Achieve an overall improvement in water quality, Prevent or reduce the degradation of water quality, or Have a benign impact on water quality.

Enforceable Limits	If monitoring is required, can not exceed Ohio water quality standards and discharge limitations specified in the policy for 19 parameters.	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Corrective Action	Not required.	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Operational Requirements/ Placement Engineering	<ul style="list-style-type: none"> • Minimum of 5 feet between the uppermost aquifer and the bottom of the liner. • Recompacted soil liner must be at least 1.5 feet thick and have a maximum permeability of 1×10^{-7} cm/sec. • Leachate collection system required for entire disposal area. • A wastewater treatment facility to collect and treat all leachate and contaminated (contact) surface runoff from the disposal area must be constructed. • A diversion ditch must be placed around the perimeter of the disposal area. • A Storm Water Pollution Prevention Plan must be implemented. • Fugitive dust controls must be implemented. • A management plan that details the operation of the facility must be submitted. 	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • No placement within 8 feet of the regional ground-water table unless DMRM approves based on information that demonstrates ground-water contamination will not occur. • If CCW exceeds limits for soil additive use and is used in areas underlying surface growing media, must be separated from the surface by a minimum of 30 inches of non-toxic material. • If CCW material is incorporated into acid-forming materials without a cap, the 4 foot non-toxic cover is required.

<i>Closure/Post Closure Care</i>		
Ongoing Ground-water Monitoring	May be required on a site-by-site basis.	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Performance Bonding or Financial Assurance	Not required.	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Other Closure/Post-closure Requirements	<ul style="list-style-type: none"> • Final cap with thickness of at least 12-18 inches of material suitable for establishing and maintaining vegetative cover. • Final grading of 2-25%, grading must prevent ponding. • Final cover and reclamation should be completed within six months of final ash placement in the mine. 	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

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OKLAHOMA

In Oklahoma, there is currently no placement of CCW in active coal mines, although it is happening in several non-coal mines where SMCRA regulations are not applicable. Oklahoma's solid waste regulations exempt CCW from all solid waste permitting requirements if disposed of in any active or inactive coal or non-coal mining operation that is permitted by the Department of Mines – it is considered a beneficial use in such a case. Oklahoma recently proposed CCW disposal regulations applicable to mine placement. These regulations are expected to be finalized in August 2001.

If placement was to occur in an active coal mine, it would be under the sole jurisdiction of the Oklahoma Department of Mines (DOM) and be subject to State mining regulations, which are substantively identical to the Federal SMCRA regulations. Placement in coal mines, however, will most likely never occur in Oklahoma. According to Tom Gilbert of the Oklahoma Department of Mines: “It is not a feasible alternative to dispose of coal combustion byproducts (CCBs) in the active surface mining pits due to the fairly thin beds of coal present in Oklahoma. The required storage volume isn't available without severely impacting the final contours. Also, transportation from the CCB producer to the active coal mines is an economic impact. We have not had to deal with the issue of returning CCBs to an active coal mine site because of these reasons, and there is little probability that CCBs will ever be returned to active surface coal mining sites.”

References

Oklahoma Statutes: Title 45 O.S. § 940; Title 45 *et seq.*

Oklahoma Department of Environmental Quality, Coal Combustion Byproducts (CCB) Policy Statement. February 29, 2000.

Cathy Frank, Department of Mines (personal communication, 5/10/01)

Tom Gilbert, Department of Mines (personal communication, 5/2/01)

John Roberts, Department of Environmental Quality (personal communication, 4/10/01)

Darrell Shults, Oklahoma Department of Mines. Comments at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

PENNSYLVANIA

Beneficial uses of CCW on mine sites (i.e., active and abandoned coal and non-coal mines) are under the control of both the Bureau of Mining and Reclamation (BMR) and the Bureau of Land Recycling and Waste Management (BLR). BMR has the authority for approval of beneficial use for CCW placement, as an alkaline addition, as low permeability material, and as a soil additive or soil substitute. BMR's beneficial use regulations and guidelines for coal ash are incorporated into the mining permit and address the following:

- Site characterization,
- Siting restrictions,
- Reclamation plan,
- Performance standards,
- Waste characterization (both pre-placement and during placement),
- Waste characteristic limits,
- Acid mine drainage,
- State approval process,
- Ground-water monitoring (both during and after placement),
- Enforceable limits,
- Operational requirements/placement engineering, and
- Closure requirements.

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Pennsylvania's regulations allow utilization of CCW in non-coal mines, but little activity has occurred. Under a demonstration project, CCW was placed in a limestone quarry and monitored for ten years. The State has denied subsequent permit applications for placing ash in quarries.

BLR does not require a solid waste disposal permit for coal ash placement (or any other beneficial uses) if the mine operator conforms to beneficial use requirements. BLR has the authority for approval of the beneficial use of coal ash for mine subsidence control, mine fire control, and mine sealing.

References

Pennsylvania Regulations: 25 PA Code 287.661-666; 25 PA Code 86-90

Beneficial Uses of Coal Ash at Active Coal Mine Sites (BMR, 563-2112-206)

Certification Guidelines for Beneficial Uses of Coal Ash (BMR, 563-2112-224)

Technical Guidance Document for Beneficial Uses of Coal Ash (BMR, 563-2112-225)

Module 25: Coal Ash Beneficial Use. 5600-PM-MRo324. Rev. 3/99

Module 27: Sewage Sludge/Coal Ash Beneficial Use.

Michael Menghini, District Mining Operations, Pennsylvania Department of Environmental Protection and Bill Pounds, Pennsylvania Department of Environmental Protection. Presentation at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

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PENNSYLVANIA				
Allowed Uses	CCW Placement	Alkaline Addition	Low Permeability Use	Soil Additive Use
Regulatory Agency Oversight	Pennsylvania Department of Environmental Protection: <ul style="list-style-type: none">Bureau of Mining and Reclamation (BMR)Bureau of Land Recycling and Waste Management (BLR)			
Before Placement				
Distinction Between Beneficial Use and Disposal	Must demonstrate that the project will achieve an overall improvement in water quality or prevent degradation of water quality from the mining and reclamation activity to be permitted as a beneficial use. Also, CCW cannot exceed the quantity of coal removed.			
Site Characterization	Substantively similar to federal SMCRA, plus: Background ground-water quality monitoring is necessary, using 6 samples taken at monthly or 6-week intervals.			Substantively similar to federal SMCRA, plus: <ul style="list-style-type: none">Provisions at left.Background analysis of soil or spoil top cover is necessary to determine if contaminated.
Siting Restrictions	Substantively similar to federal SMCRA, plus: Use allowed only in: <ul style="list-style-type: none">The pit or area from which coal is extracted under a surface coal mining permit.Abandoned coal mining areas located within the surface coal ming permit area.Coal refuse disposal sites.			Substantively similar to federal SMCRA, plus: <ul style="list-style-type: none">Provisions at left.Not within 100 feet of a stream or wetland.Not within 300 feet of a water source.Not within 100 feet of a sinkhole or area draining into a sinkhole.Not within 300 feet of an exceptional value wetland.
Reclamation Plan	Substantively similar to federal SMCRA, plus: Beneficial uses must be described in the reclamation plan as part of the mine permit application or as part of the mine			

PENNSYLVANIA				
Allowed Uses	CCW Placement	Alkaline Addition	Low Permeability Use	Soil Additive Use
	reclamation project.			
Waste Characterization	Certification system must be approved by BMR, includes testing (at the facility generating the ash) for 20 constituents, pH, calcium carbonate equivalent, and hydraulic conductivity (SPLP used for leachate analysis of all metals and pH).			
Waste Characteristic Limits	<ul style="list-style-type: none">Maximum acceptable leachate concentration is normally 25 times the ground-water parameters for metals and other cations, or 10 times the ground-water parameters for nonmetals.pH between 7.0-12.5.	As for CCW placement, plus: <ul style="list-style-type: none">Calcium carbonate equivalent of at least 100 parts per thousand or 10% by dry weight.	As for CCW placement, plus: <ul style="list-style-type: none">Hydraulic conductivity 1.0x10⁻⁶ cm/sec or less.	As for CCW placement, plus: <ul style="list-style-type: none">pH between 6.5-8.0.Maximum loading rates for 9 contaminants (mostly metals).As a liming agent, calcium carbonate equivalent of at least 100 parts per thousand or 10% by dry weight.
Address Acid-Base Balance/Acid Mine Drainage	<i>Substantively similar to federal SMCRA, no additional requirements.</i>	<i>Substantively similar to federal SMCRA, plus:</i> Specific application and ground-water monitoring requirements for application of coal ash as an alkaline addition.	<i>Substantively similar to federal SMCRA, no additional requirements.</i>	
State Approval Required to Proceed	CCW must be certified for beneficial uses by BMR and addressed in the reclamation plan under the mining permit or mine reclamation project. A new permit application or a major permit revision (using Modules 25/27) is required to use coal ash at an active mine site.			
Public Participation	Public notice required.			Not required.

PENNSYLVANIA				
Allowed Uses	CCW Placement	Alkaline Addition	Low Permeability Use	Soil Additive Use
<i>During Placement</i>				
Ongoing Waste Characterization	The generator must submit information every 6 months (or sooner if there are any changes in operation of the combustion unit generating the coal ash) to demonstrate that the ash continues to meet the certification guidelines.			
Ground-water Monitoring	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • For active coal mine sites, quarterly sampling for 11 parameters and annually for 15 more parameters. • For abandoned mine sites, sampling frequency determined by the BMR for 26 parameters. • There must be at least one downgradient monitoring point from an active coal mine site. 			<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Performance Standards	<i>Substantively similar to federal SMCRA, no additional requirements.</i>			
Enforceable Limits	<i>Substantively similar to federal SMCRA, plus:</i> Cannot produce a leachate exceeding DEP established limits.			
Corrective Action	<i>Substantively similar to federal SMCRA, plus:</i> State has specific corrective action authority applicable to mine placement.			
Operational Requirements/ Placement Engineering	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • No waste or other materials may be mixed with CCW except for the purposes of pH adjustment and hardening. • The bottom of ash must be at least 8 feet above the top of the regional ground-water table elevation. • Dust control measures. • Erosion and sediment controls. • An operations map showing the areal extent of the beneficial use of coal ash and the monitoring locations, if applicable. 	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • Provisions for CCW placement. • Must have a minimum thickness of 2 feet (exceptions on a site-by-site basis). 	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • Provisions for CCW placement. • Use as soil substitute cannot exceed 3 feet in depth. • Use as soil additive cannot exceed 1 foot in depth. • Control surface runoff with runoff control structures. • Not in contact with the 	

PENNSYLVANIA				
Allowed Uses	CCW Placement	Alkaline Addition	Low Permeability Use	Soil Additive Use
				seasonal high water table. <ul style="list-style-type: none"> • CCW must be incorporated into the soil within 48 hours of application. • May not be applied to soil being used for agriculture where the soil pH is <5.5.
Closure/Post Closure Care				
Ongoing Ground-water Monitoring	<i>Substantively similar to federal SMCRA, plus:</i> <ul style="list-style-type: none"> • Monitoring must continue with quarterly reports and annual reports submitted until closure. • Ground-water monitoring may be extended by BMR if there is an indication of ground-water degradation. 			<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Performance Bonding or Financial Assurance	<i>Substantively similar to federal SMCRA, no additional requirements.</i>			
Other Closure/Post-closure Requirements	<i>Substantively similar to federal SMCRA, no additional requirements.</i>			

TENNESSEE

In Tennessee, CCW mine placement has yet to occur. If it were to occur, it would be subject to applicable Federal mining regulations – the coal mining program is administered by US Department of the Interior’s Office of Surface Mine Reclamation and Enforcement (OSM) rather than the State. In addition, the Tennessee Department of Environmental Conservation (TDEC), Division of Solid and Hazardous Waste Management Solid Waste Program allows CCW to be beneficially reused under specific coal ash permit-by-rule regulations if testing confirms the CCW to be non-hazardous. The permit-by-rule regulations would likely be applied to CCW mine placement, were such a project proposed. The regulations require prior written notification of the beneficial use (or a request for a case-by-case approval) and address the following:

- Siting restrictions,
- Reclamation plan,
- Waste characteristic limits,
- State approval process,
- Ground-water monitoring (may be required on a site-by-site basis),
- Operational requirements/placement engineering,
- Financial assurance (may be required on a site-by-site basis), and
- Closure requirements.

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References

Tennessee Regulations: TCA § 1200-1-7-.02(1)(c)(1)(ii)

Glen Pugh, TDEC, Division of Solid/Hazardous Waste Management (personal communication, 4/25/01)

TENNESSEE	
Regulatory Agency Oversight	<ul style="list-style-type: none"> • US Department of the Interior OSM • Tennessee Department of Environmental Conservation (TDEC), Division of Solid and Hazardous Waste Management
Allowed Uses	Mine placement.
<i>Before Placement</i>	
Distinction Between Beneficial Use and Disposal	Not required (<i>as per federal SMCRA</i>)
Site Characterization	<i>Regulated by OSM under federal SMCRA, no additional requirements.</i>
Siting Restrictions	<i>Regulated by OSM under federal SMCRA, plus:</i> <ul style="list-style-type: none"> • Not in wetlands, sink holes or caves, or in 100-year floodplain unless certain conditions are met. • Cannot be located where the activity would affect endangered or threatened species or habitats.
Reclamation Plan	<i>Regulated by OSM under federal SMCRA, no additional requirements.</i>
Waste Characterization	Not required (<i>as per federal SMCRA</i>).
Waste Characteristic Limits	CCW must be non-hazardous.
Address Acid-Base Balance/Acid Mine Drainage	<i>Regulated by OSM under federal SMCRA, no additional requirements.</i>
State Approval Required to Proceed	<i>Regulated by OSM under federal SMCRA, plus:</i> Prior written notification of the beneficial use (or a request for a case-by-case approval) must be submitted to TDEC and approved. Permit-by-rule authorization must be kept at the facility.
Public Participation	<i>Regulated by OSM under federal SMCRA, no additional requirements.</i>

TENNESSEE	
<i>During Placement</i>	
Ongoing Waste Characterization	Not required (<i>as per federal SMCRA</i>).
Ground-water Monitoring	<i>Regulated by OSM under federal SMCRA, plus:</i> Additional monitoring may be required by TDEC for specially-approved projects.
Performance Standards	<i>Regulated by OSM under federal SMCRA, plus:</i> Fill area must be operated, maintained, and closed in a manner so as to minimize: <ul style="list-style-type: none"> • Potential for harmful release of CCW. • Potential for harm to public through uncontrolled access.
Enforceable Limits	<i>Regulated by OSM under federal SMCRA, no additional requirements.</i>
Corrective Action	<i>Regulated by OSM under federal SMCRA, no additional requirements.</i>
Operational Requirements/ Placement Engineering	<i>Regulated by OSM under federal SMCRA, plus:</i> Must have: <ul style="list-style-type: none"> • The appropriate equipment available to spread and compact the coal ash and for handling the earthwork. • An artificial or natural barrier to control access. • A geologic buffer of 3 feet between base of fill and the seasonal higher water table of the uppermost unconfined aquifer. • Dust control measures. • One permanent benchmark (i.e., concrete marker).

TENNESSEE	
<i>Closure/Post Closure Care</i>	
Ongoing Ground-water Monitoring	<i>Regulated by OSM under federal SMCRA, plus:</i> Additional monitoring may be required by TDEC for specially-approved projects.
Performance Bonding or Financial Assurance	<i>Regulated by OSM under federal SMCRA, plus:</i> Financial assurance may be required by TDEC for specially-approved projects.
Other Closure/Post-closure Requirements	<i>Regulated by OSM under federal SMCRA, plus:</i> <ul style="list-style-type: none"> • Within 90 days of completion, final cover of 2 feet of compacted soil, except those areas already covered by barriers to water infiltration. • Upper 6 inches of cover must be able to support vegetation. • Final surface graded and provided with drainage facilities in a manner that: minimizes erosion of cover material (no steep slopes, use of mulch, silt barriers), promotes drainage (prevents pooling), and provides a drainage system consistent with the surrounding area.

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TEXAS

Texas Natural Resource Conservation Commission (TNRCC) solid waste policy allows beneficial uses of CCW as a “co-product,” including as backfill to achieve original contours at mine sites. If the placement of CCW at a mine site meets this definition as a beneficial use, it is regulated by the Railroad Commission of Texas, Surface Mining and Reclamation Division (SMRD) and not by TNRCC. SMRD applies State mining regulations that are substantively similar to the federal SMCRA regulations. If the placement not approved as a beneficial use, TNRCC subjects the practice to solid waste regulations and SMRD defers entirely to TNRCC.

In Texas, coal combustion waste falls under the program for nonhazardous industrial solid waste. No permit is required for disposal of nonhazardous industrial solid waste, if: (1) the waste is disposed on property owned or otherwise effectively controlled by the owner or operator of the plant from which the waste results, (2) the property is within 50 miles of the plant, and (3) the waste is not commingled with waste from any other source not owned by the same person. However, the operator must still notify the State (and include information on waste composition, facility design, and site geology), maintain certain records, and close the site in compliance with the Texas Risk Reduction Program. Mines accepting coal combustion waste not meeting the three permit-exemption criteria must obtain a solid waste permit and are subject to the regulations that address the following:

- Site characterization,
- Siting restrictions,
- Waste characterization,
- Waste characteristic limits,
- State approval process,
- Public participation,
- Ground-water monitoring (both during and after placement),
- Performance standards,
- Enforceable limits,
- Corrective action,
- Operational requirements/placement engineering,
- Financial assurance, and
- Closure requirements.

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Nonhazardous industrial solid waste is characterized into Class 1, Class 2, or Class 3 waste. Class 1 is waste that is toxic, corrosive, flammable or may pose a substantial danger to human health or the environment if improperly disposed. Class 3 is inert and essentially insoluble solid waste. Class 2 is any waste that fits neither the Class 1 or Class 3 definitions. According to TNRCC, CCW in Texas is most often characterized as Class 2 waste and sometimes as Class 3. The requirements below are for disposal of Class 2 waste. The requirements for Class 3 are less restrictive—for example, monitoring is not required.

References

Texas Statutes: 5 THSC § 361; TWC § 26.121

Texas Regulations: 30 TAC § 37, § 39, § 330, and § 335 (Subchapters A and R); 16 TAC 12

TNRCC Memo: Coal Combustion By-Products and TRNCC Regulations. August 25, 1995.

TNRCC Memo (to an Operator): Use of Bottom Ash and Fly Ash as a "Co-Product." March 25, 1998.

Jesse Boultinghouse, Texas Natural Resource Conservation Commission (personal communication, 4/11/01)

John Kaudol, Railroad Commission of Texas, Surface Mining and Reclamation Division (personal communication, 4/26/01)

Susi Ferguson, Texas Natural Resource Conservation Commission (personal communication, 6/21/01)

Susi Ferguson, Texas Natural Resource Conservation Commission, and Melvin Hodgkiss, Railroad Commission of Texas, Surface Mining and Reclamation Division. Comments at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

TEXAS		
	Disposal	Beneficial Use
Regulatory Agency Oversight	Texas Natural Resource Conservation Commission (TNRCC)	Railroad Commission of Texas, Surface Mining and Reclamation Division
Allowed Uses	Placement at mine sites in approved disposal areas.	Placement at mine sites for beneficial uses, including backfill to achieve original contour
<i>Before Placement</i>		
Distinction Between Beneficial Use and Disposal	Placement other than for the purpose of reclamation or placement that delays contemporaneous reclamation is defined as disposal.	Placement for the purpose of reclamation is defined as beneficial use
Site Characterization	The background water quality must be established.	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Siting Restrictions	There are restrictions on: <ul style="list-style-type: none"> • Fault areas (not within 200 feet of a fault). • Floodplains. • Wetlands. • Seismic impact zones. • Unstable areas. 	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Reclamation Plan	Not required.	<i>Substantively similar to federal SMCRA, plus: CCW placement must be addressed in the reclamation plan</i>
Waste Characterization	Waste characterization is required using approved EPA methods or an alternate method. The coal combustion waste may be designated a Class 1, 2, or 3 waste.	Not required (<i>as per federal SMCRA</i>)
Waste Characteristic Limits		None specified (<i>as per federal SMCRA</i>)
Address Acid-Base Balance/Acid Mine Drainage	Not required.	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

TEXAS		
	Disposal	Beneficial Use
State Approval Required to Proceed	A solid waste permit is required, unless the waste is disposed on the generator's own property. If the latter, only notification is required.	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Public Participation	The issuance of a solid waste permit is subject to public notice and comment requirements that are substantively similar to SMCRA's.	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
<i>During Placement</i>		
Ongoing Waste Characterization	Not required.	Not required (<i>as per federal SMCRA</i>).
Ground-water Monitoring	<ul style="list-style-type: none"> • Must submit a ground-water sampling and analysis plan. • Downgradient monitoring system shall ensure the detection of ground-water contamination of the uppermost aquifer. • At a minimum, detection monitoring for 62 constituents is required, although TNRCC may alter the list. • Assessment monitoring is required whenever a statistically significant change from background levels has been detected. • Semi-annual sampling is required through the post-closure period. 	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Performance Standards	<p>The disposal activity may not cause:</p> <ul style="list-style-type: none"> • The discharge or imminent threat of discharge into waters of the State without NPDES permit authorization. • The creation and maintenance of a nuisance. • The endangerment of the public health and welfare. 	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

TEXAS		
	Disposal	Beneficial Use
Enforceable Limits	If assessment monitoring detects a statistically significant level above ground-water quality protection standards, then an assessment of corrective measures is required.	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Corrective Action		<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Operational Requirements/ Placement Engineering	<ul style="list-style-type: none"> • Site operating plan. • Composite liner (30 mil flexible membrane liner and 2 feet compacted soil). • Leachate collection and removal system. • Ensure lowest level of disposal is above the seasonal high water table. • Compact and cover daily. • Dust control. • Endangered species protection. 	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Closure/Post Closure Care		
Ongoing Ground-water Monitoring	Required until the end of the post-closure period.	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Performance Bonding or Financial Assurance	<ul style="list-style-type: none"> • Required for closure, post-closure, and the completion of any corrective action. • Trust fund, letter of credit, insurance, financial test, or corporate guarantee. 	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

TEXAS		
	Disposal	Beneficial Use
Other Closure/Post-closure Requirements	<ul style="list-style-type: none"> • Final closure and post-closure plans required. • Within 180 days of final receipt of waste, must place a final cover system with at least 2 feet of soil and consisting of an infiltration layer and an erosion layer of at least 6 inches. • Closure must be compliant with the standards of the Texas Risk Reduction Program. This program requires that the closure design minimize or eliminate post-closure escape of waste, contaminants, leachate, or run-off and minimize or eliminate the need for further maintenance and control. • Post-closure period of at least 30 years (may be reduced on a case-by-case basis). 	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

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UTAH

Currently, there is no placement of CCW in Utah mines. Under Utah solid waste law, CCW is exempt from regulation as a solid waste unless it causes a public nuisance or public health hazard, or is otherwise determined to be a hazardous waste. Therefore, if CCW mine placement were to occur, it would be under the sole jurisdiction of the Utah Department of Natural Resources, Division of Oil, Gas, and Mining and be subject to State mining regulations that are substantively identical to Federal SMCRA regulations. According to Daron Haddock of the Division of Oil, Gas, and Mining, the review and approval of the activity, as part of the reclamation plan under a surface mining permit, would most likely be the same as for the onsite disposal of non-coal mine waste or coal processing waste.

References

Utah Statutes: UCA 19-6-102(17)(b)(iii)

Utah Regulations: R645-100 *et seq.*

Daron Haddock, Utah Department of Natural Resources, Division of Oil, Gas, and Mining (personal communication, 5/2/01)

Daron Haddock, Utah Department of Natural Resources, Division of Oil, Gas, and Mining. Comments at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

VIRGINIA

The Virginia Department of Mines, Minerals and Energy, Division of Mined Land Reclamation (DMME) has sole jurisdiction over the beneficial use of CCW on permitted mine sites. Under Virginia law, CCWs are exempt from all solid waste regulations if considered a beneficial use under DMME's program. The Virginia Department of Environmental Quality has developed specific regulations regarding the beneficial use of CCW, which are to be implemented by DMME in cases of mine reclamation or mine refuse disposal (which have yet to happen since the regulations were developed in 1995). The regulations do not require DMME approval prior to CCW mine placement, but do require notification. The regulations also include the following:

- Siting restrictions,
- Reclamation plan,
- Waste characterization,
- Waste characteristic limits,
- Enforceable limits (may be established on a site-by-site basis),
- Operational requirements/placement engineering, and
- Closure requirements.

If the use of CCW for mine placement activity is not considered a beneficial use by DMME or if the CCW contains a constituent that exceeds the waste characteristic limits set forth in the regulations, then a solid waste permit is required. Virginia's solid waste permit requirements are summarized in *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*, December 14, 2000. Because details regarding the applicability of these requirements to mine placement projects have not yet been tested through implementation, the requirements are not summarized here.

References

Virginia Statutes: 45.1 CV Chapter 19

VR 672-20-20, February 22, 1995; VR 480-03-19

9 VAC 20-80-150, 20-80-160, and 20-85 *et seq.*

Guidelines for Use of Coal Combustion By-Products on DMME/DMLR Permits (2/95)

Lynn Haynes, Virginia Department of Mines, Minerals and Energy, Division of Mined Land Reclamation (personal communication, 6/21/01)

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VIRGINIA	
Regulatory Agency Oversight	Virginia Department of Environmental Quality, Department of Mines, Minerals and Energy, Division of Mined Land Reclamation (DMME)
Allowed Uses	For mine reclamation or mine refuse disposal on a DMME-permitted mine site.
<i>Before Placement</i>	
Distinction Between Beneficial Use and Disposal	The operator must show that the use of the CCW on the mine site would serve a beneficial purpose in the reclamation efforts, otherwise it would be considered disposal. However, since there has yet to be a proposal to use CCW on a mine site, there has been no test of what is considered to be a “beneficial use.”
Site Characterization	<i>Substantively similar to federal SMCRA, plus:</i> The Probable Hydrologic Consequences (PHC) assessment must also address use of CCW on the coal mine site.
Siting Restrictions	<i>Substantively similar to federal SMCRA, plus:</i> CCW cannot be placed: <ul style="list-style-type: none"> • In areas subject to base floods, except in certain situations. • With the vertical separation between the CCW and the maximum seasonal water table or bedrock less than two feet. • Closer than 100 feet from any perennial stream, water well, or sinkhole. • Closer than 25 feet from a bedrock outcrop or property boundaries. • In wetlands, unless appropriate permits are obtained. • At the site of an active or inactive dump, unpermitted landfill, lagoon or similar facility, even if closed.
Reclamation Plan	<i>Substantively similar to federal SMCRA, plus:</i> 30 days prior to initial placement: <ul style="list-style-type: none"> • Certify owner has legal control for the project life and closure period, operation is in compliance with local ordinances, and owner will allow compliance inspections. • Describe intended use, the site, estimated start and completion dates, and the volume to be used. • Certify that locational restrictions are satisfied and project is designed to specified standards. • Submit an operation plan and closure plan.
Waste Characterization	Describe the physical and chemical characteristics of the CCW, including TCLP analyses for 8 constituents.

VIRGINIA	
Waste Characteristic Limits	<ul style="list-style-type: none"> • Arsenic, Chromium, Lead, Silver less than 5.0 mg/l. • Barium less than 100 mg/l. • Cadmium and Selenium less than 1.0 mg/l. • Mercury less than 0.2 mg/l.
Address Acid-Base Balance/Acid Mine Drainage	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
State Approval Required to Proceed	If the mining and reclamation permit already includes the applicable provisions of the CCW regulations (Parts II and IV), then CCW placement would require only notification to DMME, including a certification and description of activities. If the permit does not already include the applicable provisions of the CCW regulations, then CCW placement would require a major permit revision.
Public Participation	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
<i>During Placement</i>	
Ongoing Waste Characterization	Not required (<i>as per federal SMCRA</i>).
Ground-water Monitoring	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Performance Standards	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Enforceable Limits	<i>Substantively similar to federal SMCRA, plus:</i> Specific enforceable limits may be established on a site-by-site basis.
Corrective Action	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Operational Requirements/ Placement Engineering	<i>Substantively similar to federal SMCRA, plus:</i> Operation plan must include: <ul style="list-style-type: none"> • Control of tracking of CCW onto public roads. • Prohibition on addition of any solid waste. • Control of fugitive dust. • CCW placed in no greater than 1 foot layers and then compacted. • A surface run-on and run-off control program.

VIRGINIA	
<i>Closure/Post Closure Care</i>	
Ongoing Ground-water Monitoring	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Performance Bonding or Financial Assurance	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Other Closure/Post-closure Requirements	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

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WASHINGTON

In Washington, placement of CCW in mines is subject to applicable Federal mining regulations – the mining program is administered by US Department of the Interior’s Office of Surface Mine Reclamation and Enforcement (OSM) rather than the State. In addition, the Washington Department of Ecology (DOE) considers CCW to be a solid waste that must be permitted when placed in a mine. The solid waste permitting authority is legislated to local health departments. At present, DOE is in the initial stages of developing CCW beneficial use policy. The current regulatory structure allows for case-specific requirements to be determined by the local authorities in the solid waste permits. The table below includes local permit requirements for a mine currently accepting CCW to be incorporated as backfill.

References

Washington Regulations: WAC 173-303-016; 173-304-461

Chuck Matthews, Washington Department of Ecology (personal communication, 4/27/01)

PacifiCorp's Centralia Coal Mine Solid Waste Permit for 2000 (issued by Lewis County Health & Social Services, Chehalis, WA)

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WASHINGTON	
Regulatory Agency Oversight	<ul style="list-style-type: none"> • US Department of the Interior OSM • Washington Department of Ecology • Local health departments
Allowed Uses	Mine placement.
<i>Before Placement</i>	
Distinction Between Beneficial Use and Disposal	Not required (<i>as per federal SMCRA</i>)
Site Characterization	<i>Regulated by OSM under federal SMCRA, no additional requirements.</i>
Siting Restrictions	<i>Regulated by OSM under federal SMCRA, plus: May not be located on any hill whose slope is unstable.</i>
Reclamation Plan	<i>Regulated by OSM under federal SMCRA, no additional requirements.</i>
Waste Characterization	Not required (<i>as per federal SMCRA</i>).
Waste Characteristic Limits	None specified (<i>as per federal SMCRA</i>).
Address Acid-Base Balance/Acid Mine Drainage	<i>Regulated by OSM under federal SMCRA, no additional requirements.</i>
State Approval Required to Proceed	<i>Regulated by OSM under federal SMCRA, plus: A solid waste disposal permit is required and must be obtained from the local health department.</i>
Public Participation	<i>Regulated by OSM under federal SMCRA, no additional requirements.</i>

WASHINGTON	
<i>During Placement</i>	
Ongoing Waste Characterization	Not required (<i>as per federal SMCRA</i>)
Ground-water Monitoring	<i>Regulated by OSM under federal SMCRA, plus:</i> <ul style="list-style-type: none"> • At least three ground-water monitoring wells are required; one upgradient and two downgradient of the backfilled areas incorporating the CCW • Monitoring data must be submitted annually
Performance Standards	<i>Regulated by OSM under federal SMCRA, no additional requirements.</i>
Enforceable Limits	<i>Regulated by OSM under federal SMCRA, no additional requirements.</i>
Corrective Action	<i>Regulated by OSM under federal SMCRA, no additional requirements.</i>
Operational Requirements/ Placement Engineering	<i>Regulated by OSM under federal SMCRA, plus:</i> <ul style="list-style-type: none"> • Maintain record of the weights or volumes and types of wastes disposed at the site • All closed portions of the site must be maintained to prevent excess water intrusion • Must be at least one person on-site during all disposal events who is a State-certified landfill operator
<i>Closure/Post Closure Care</i>	
Ongoing Ground-water Monitoring	<i>Regulated by OSM under federal SMCRA, no additional requirements.</i>
Performance Bonding or Financial Assurance	<i>Regulated by OSM under federal SMCRA, no additional requirements.</i>
Other Closure/Post-closure Requirements	<i>Regulated by OSM under federal SMCRA, no additional requirements.</i>

WEST VIRGINIA

When CCW is beneficially used at mine sites, the activity is under the authority of the West Virginia Department of Environmental Protection Office of Mining and Reclamation (OMR). OMR applies State mining regulations that are substantively similar to the Federal SMCRA regulations. OMR requires a modification of the mining permit and has developed written guidelines specific to CCW beneficial use at mine sites. The guidelines address the following:

- Site characterization,
- Reclamation plan,
- Waste characterization (both pre-placement and during placement),
- Acid mine drainage,
- State approval process,
- Ground-water monitoring (both during and after placement),
- Enforceable limits (may be established on a site-by-site basis), and
- Operational requirements/placement engineering.

It is the State's policy to use a volume ratio of 8:1 (CCW to coal refuse) to decide if the use of CCW is a beneficial use at the mine site. If the ratio is exceeded, the use is then considered disposal. Projects constituting disposal under this definition have not yet been pursued in West Virginia. According to OMR staff, however, were such projects proposed, they would require a solid waste permit from the Department of Environmental Protection's Office of Solid Waste (OSW). West Virginia's solid waste permit requirements are summarized in *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*, December 14, 2000. Because details regarding the applicability of these requirements to mine placement projects have not yet be tested through implementation, the requirements are not summarized here.

References

West Virginia Statutes: West Virginia Code Chapter 22, Article 3

West Virginia Regulations: 33 CSR 1-5.5.b.4; 33 CSR 2, Sections 1-22

Mining and Reclamation Policy Memo: Disposal and Utilization of Coal Ash on Surface Mining Operations. January 3, 1994.

Application for Coal Ash Utilization. MR-36, January 1994.

Coal Combustion By-Product Utilization Policy. January 13, 1998.

Harold "Rocky" Parsons, Office of Mining and Reclamation, West Virginia Department of Environmental Protection (personal communication 4/11/01)

Harold "Rocky" Parsons, Office of Mining and Reclamation, West Virginia Department of Environmental Protection. Presentation at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

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WEST VIRGINIA	
Regulatory Agency Oversight	West Virginia Department of Environmental Protection: <ul style="list-style-type: none"> • Office of Mining and Reclamation (OMR) • Office of Solid Waste (OSW)
Allowed Uses	Use as soil amendments, use on surface mining operations, to fill voids in permitted underground mines, and other uses as approved by OMR.
<i>Before Placement</i>	
Distinction Between Beneficial Use and Disposal	Under State policy, projects using less than an 8:1 ratio of CCW to coal refuse are defined as beneficial use and subject to the requirements summarized here. Projects exceeding this ratio would be considered disposal and regulated by OSW.
Site Characterization	<i>Substantively similar to federal SMCRA, plus:</i> Water quality sampling and analysis for 19 parameters is required.
Siting Restrictions	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Reclamation Plan	<i>Substantively similar to federal SMCRA, plus:</i> Applicants must provide a coal ash utilization plan that includes: <ul style="list-style-type: none"> • A map of the proposed coal ash utilization area, with certain attributes marked, and a cross-section map. • A description of how the use will affect the mining and reclamation plan, and post-mining land use.
Waste Characterization	At a minimum, leachate analysis for 19 parameters (TCLP testing for metals only) and full testing for all new sources is required.
Waste Characteristic Limits	CCW which exhibits potentially toxic or potentially acid producing characteristics will not be approved for beneficial use.
Address Acid-Base Balance/Acid Mine Drainage	<i>Substantively similar to federal SMCRA, plus:</i> Assessment of neutralization potential is required using procedures laid out in OMR guidelines.
State Approval Required to Proceed	<i>Substantively similar to federal SMCRA, plus:</i> Requires submission of the Application for Coal Ash Utilization form and a modification of the mining permit, or a solid waste disposal permit (if considered disposal rather than a beneficial use). Modification of the mining permit was initially treated as a major modification, but is currently treated as a minor modification, with some uses pre-approved and requiring notification only.

WEST VIRGINIA	
Public Participation	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

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WEST VIRGINIA	
<i>During Placement</i>	
Ongoing Waste Characterization	Periodic retesting of all parameters may be required from time to time by the OMR, but the TCLP test (for metals only) must be performed at least annually.
Ground-water Monitoring	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Performance Standards	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Enforceable Limits	<i>Substantively similar to federal SMCRA, plus:</i> Specific enforceable limits may be established on a site-by-site basis.
Corrective Action	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Operational Requirements/ Placement Engineering	<i>Substantively similar to federal SMCRA, no additional requirements, plus:</i> Applicants must provide a description of the following in the coal ash utilization plan: <ul style="list-style-type: none"> • Site preparation. • Unloading and stockpiling areas. • Sequence of mining/utilization techniques. • Phases of utilization: 1) compaction of coal ash, 2) equipment to be used, 3) thickness of lifts, 4) methods of utilization. • Application of cover material. • Revegetation procedure. • Dust control methods. • Final slopes and closure procedures.
<i>Closure/Post Closure Care</i>	
Ongoing Ground-water Monitoring	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Performance Bonding or Financial Assurance	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Other Closure/Post-closure Requirements	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

WYOMING

The Wyoming Department of Environmental Protection Land Quality Division (LQD) has sole authority over mine disposal of CCW from a mine mouth power plant. Such activity is subject to the general waste provisions of the State mining regulations, which are substantively similar to the federal SMCRA regulations. The LQD is currently developing new regulations that address waste disposal at coal mines and will include specific provisions regarding CCW. The State's current policy is to require a modification to the mining permit for CCW placement. Under its current policy, LQD also requires waste characterization prior to placement.

The Wyoming Department of Environmental Protection Solid and Hazardous Waste Division (SHWD) shares authority with LQD over mine disposal of CCW from a non-mine mouth power plant. Such projects have not yet been pursued in Wyoming. According to Robert A. Doctor of SHWD, however, such activity would likely require a solid waste disposal permit. Wyoming's solid waste permit requirements are summarized in *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*, December 14, 2000 and are not included in this summary. Mr. Doctor also noted that SHWD is currently working on a Solid Waste Beneficial Use Guideline that will include CCW. These guidelines most likely will not consider mine placement to be a beneficial use.

References

Wyoming Statutes: WS § 35-11-103(d)(ii)(D); WS § 35-11-401 *et seq.*

Wyoming Regulations: WAC SWM CH.1, § 1(e)(i); WAC LQD CHS. 1 to 20

Robert A. Doctor, Program Manager, Solid Waste Permitting, Solid and Hazardous Waste Division, Wyoming Department of Environmental Protection (personal communication, 4/16/01)

Rick Chancellor, Land Quality Division, Wyoming Department of Environmental Protection (personal communication, 4/27/01 and 6/15/01)

Paige Smith, Land Quality Division, Wyoming Department of Environmental Protection. Comments at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

WYOMING	
Regulatory Agency Oversight	Wyoming Department of Environmental Quality: <ul style="list-style-type: none"> • Land Quality Division (LQD) • Solid and Hazardous Waste Division (SHWD)
Allowed Uses	Mine placement
<i>Before Placement</i>	
Distinction Between Beneficial Use and Disposal	Wyoming does not currently distinguish between beneficial use and disposal. Placement of CCW from mine-mouth power plants, however, is regulated by the LQD. Placement of CCW from non-mine mouth power plants would be regulated by SHWD.
Site Characterization	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Siting Restrictions	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Reclamation Plan	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Waste Characterization	The LQD treats CCW as a waste material and requires tests to determine the proper method of disposal.
Waste Characteristic Limits	None specified (<i>as per federal SMCRA</i>)
Address Acid-Base Balance/Acid Mine Drainage	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
State Approval Required to Proceed	<i>Substantively similar to federal SMCRA, plus:</i> Requires a modification of the mining permit, or issuance of a solid waste permit, depending on the location of the generating facility. A first time application (i.e., a mine that did not have previous approval as opposed to a mine that wanted to revise a previous approval) would require a major permit modification.
Public Participation	<i>Substantively similar to federal SMCRA, no additional requirements.</i>

WYOMING	
<i>During Placement</i>	
Ongoing Waste Characterization	Not required (<i>as per federal SMCRA</i>)
Ground-water Monitoring	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Performance Standards	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Enforceable Limits	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Corrective Action	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Operational Requirements/ Placement Engineering	<i>Substantively similar to federal SMCRA, plus: Based on waste characterization data, LQD has imposed specific placement engineering requirements on a site-by-site basis. For example, they have required certain CCW to be encapsulated while others have been placed in specific areas of the backfill out of contact with groundwater and out of plant routing depth.</i>
<i>Closure/Post Closure Care</i>	
Ongoing Ground-water Monitoring	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Performance Bonding or Financial Assurance	<i>Substantively similar to federal SMCRA, no additional requirements.</i>
Other Closure/Post-closure Requirements	<i>Substantively similar to federal SMCRA, no additional requirements.</i>